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DIESEL PROGRESS

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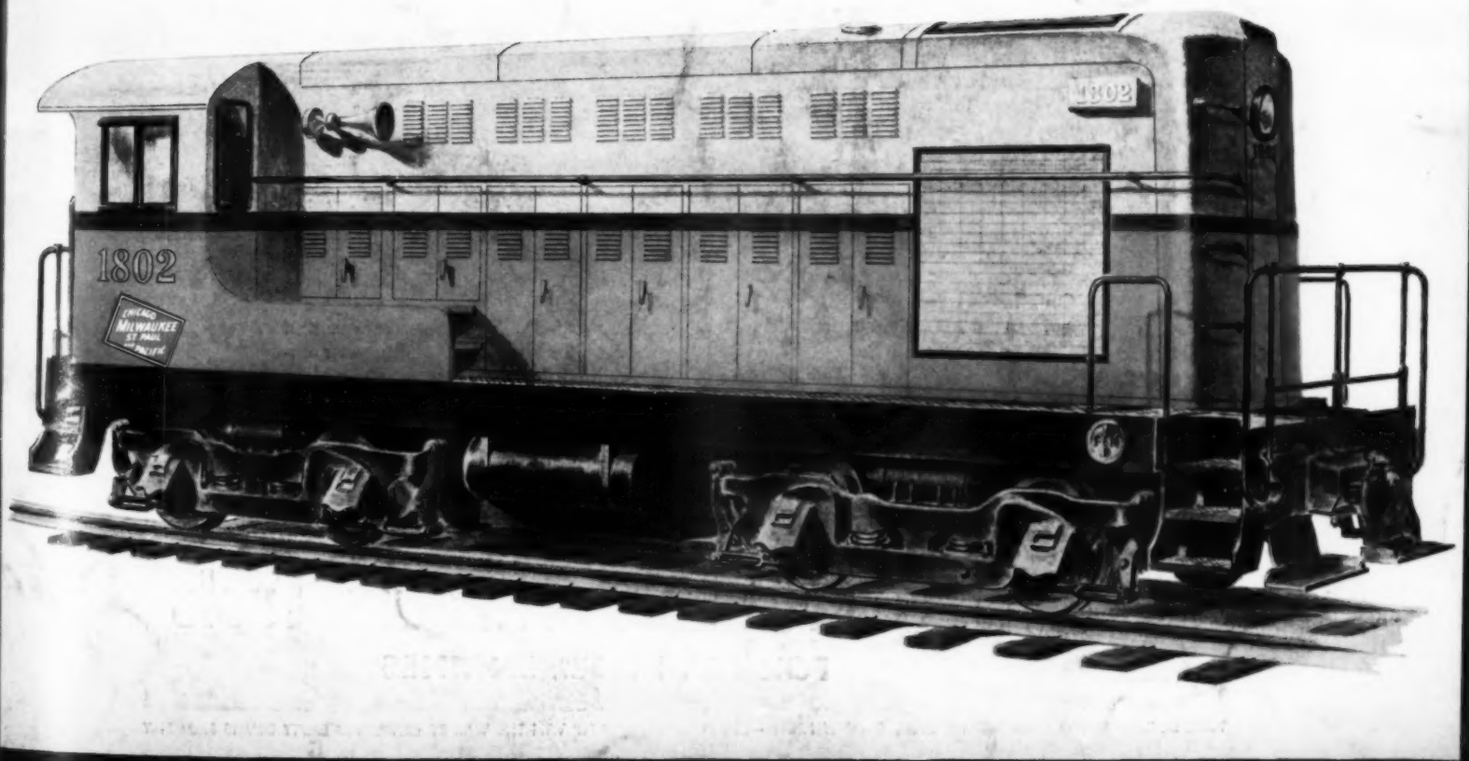

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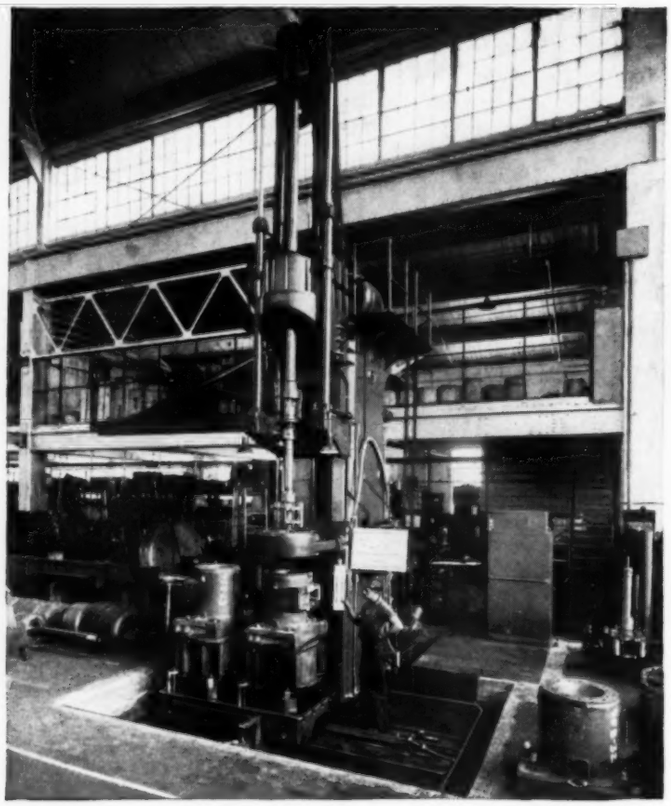

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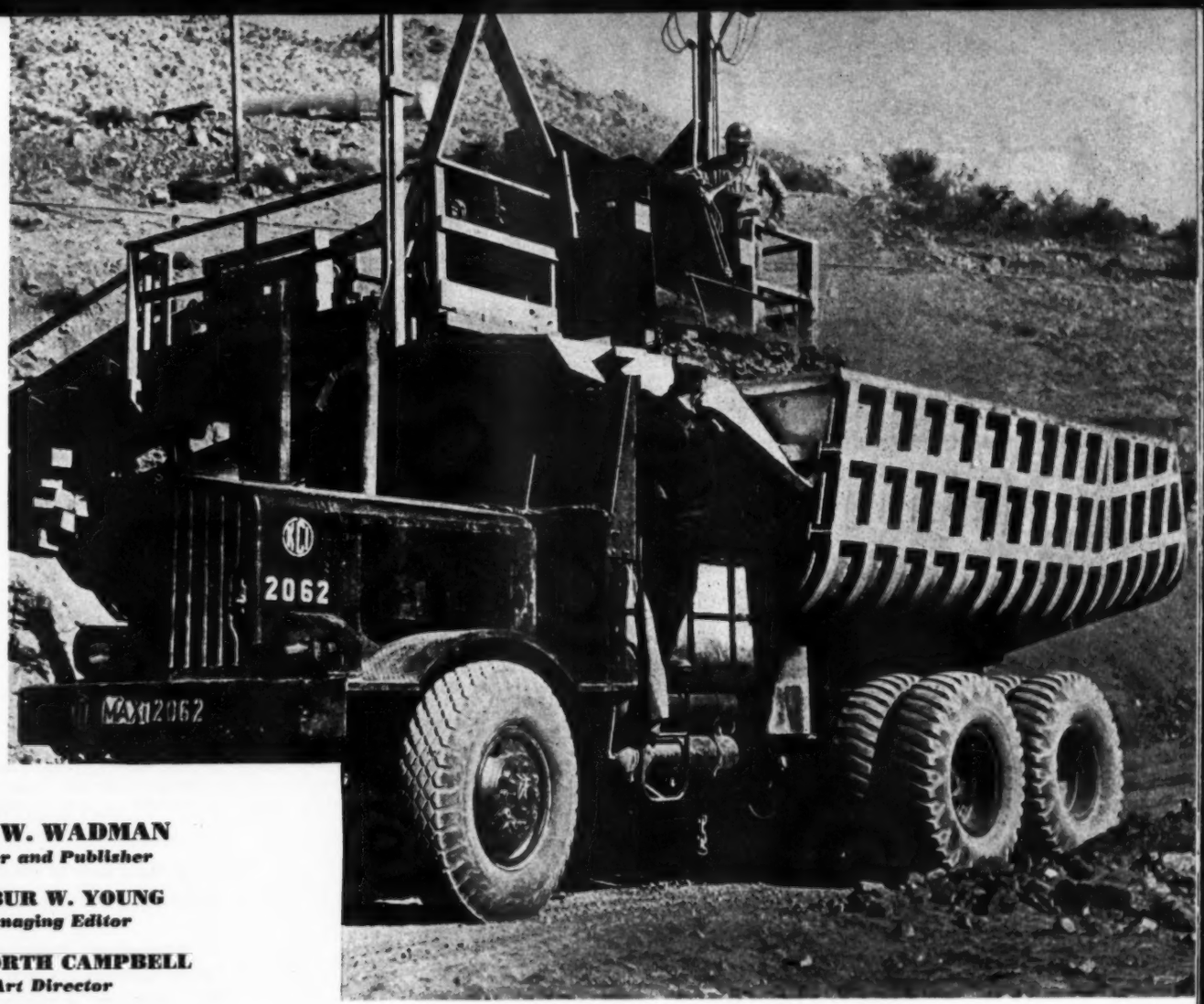
TUNE IN THE TEXACO STAR THEATRE EVERY SUNDAY NIGHT—CBS ★ HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY

DIESEL PROGRESS, for September, 1944. Volume X, Number 9. DIESEL PROGRESS is published monthly by Diesel Engines, Inc., 2 West Forty-fifth St., New York 19, N. Y. Rex W. Wadman, President. Acceptance under the Act of June 5, 1943, at East Stroudsburg, Pa., authorized March 27, 1940. Subscription rates: $5.00 per year, single copy, 50c.



REX W. WADMAN
Editor and Publisher

WILBUR W. YOUNG
Managing Editor

HEYWORTH CAMPBELL
Art Director

FRONT COVER ILLUSTRATION: The new Fairbanks-Morse 120-Ton Diesel-Electric switching locomotive recently unveiled at Beloit, Wisconsin. Motive power is a vertical, 6-cylinder, 1000 hp. opposed piston F-M Diesel.

TABLE OF CONTENTS ILLUSTRATION: A fifty-ton Maxi truck powered with a Waukesha-Hesselman engine taking on 25 yards of mine-run iron ore.

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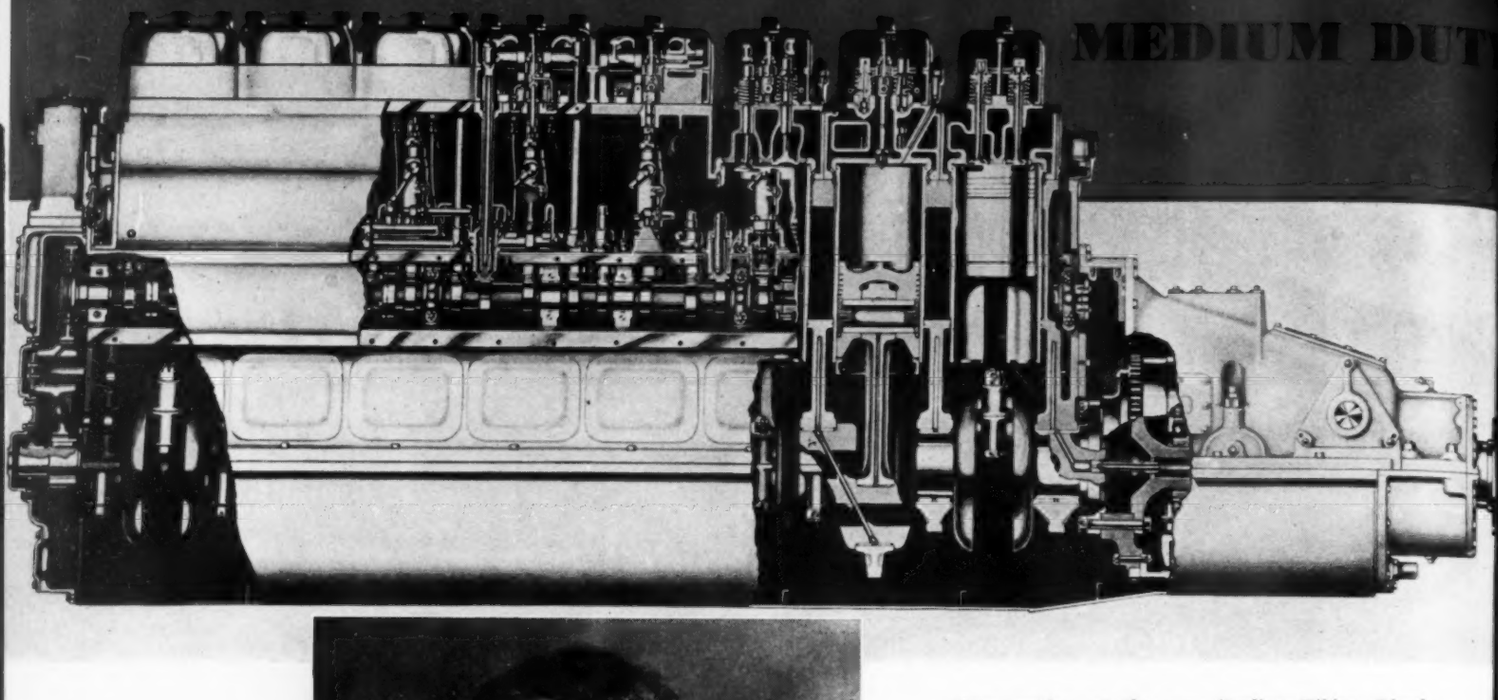


Cross section of the new Sterling Viking Diesel Engine, which is produced in four models, six and eight cylinders, supercharged and unsupercharged.

Hans Bohuslav, Vice President in Charge of Engineering for The Sterling Engine Company, who directed the development of the new Sterling Viking Diesel.

RECENTLY I went up to Buffalo to see the new Sterling Viking Diesel Engine. This was like returning home for me because away back in history I was Advertising Manager for the Sterling Engine Company for about three years and my boss in those days was Charles A. Criqui who for so many years was President of the Sterling Engine Company and who is now a member of the Board of Directors and still quite active in the management of the company. I have a very soft spot in my heart for Sterling because it was my first real job and I learned a lot in the three years that I worked up there as Advertising Manager. In the thirty years that has transpired since I left, Sterling has grown in size and in reputation, and on numerous occasions in the past I have sat down with the management and discussed the possibilities of developing a line of Sterling Diesels. This has now become an accomplished fact, and I thoroughly enjoyed the opportunity which was offered me to see the new engine, run tests on it and learn some of the details of their ambitious plans to invade the Diesel market.

As many of our readers know, the Sterling Engine Company has been actively engaged in the manufacture of gasoline engines for some forty years, and they have been carrying on research and experimental work on Diesels for over fifteen years. Several years ago they brought Hans Bohuslav from San Francisco to Buffalo and made him Vice President in Charge of Engineering. Mr. Bohuslav is well known to most of you for the work he did out in San Francisco as Chief Engineer for the Enterprise Engine Company. He is an outstanding Diesel engineer and Diesel designer and in looking over this new Sterling Viking Diesel, I see many of the good features that he incorporated in his older designs worked into this new model.

Mr. Bohuslav has been given a free hand in Buffalo and has worked actively under the guidance of and with the full cooperation of Addison F. Vars, who is now President of the company, and it was very evident to me that Mr. Vars is proving to be a very capable corporate head. His father, Harry Thorp Vars, was one of the founders of the Sterling Engine Company and I knew him very well back in the old days. Addison Vars brings to Sterling a strong, enthusiastic, imaginative directing head and I see a big future ahead for the company under his management.

DIESEL DEVELOPED BY STERLING

By REX W. WADMAN

Addison F. Vars, President of the Sterling Engine Company, whose father, Harry Thorp Vars, was one of the original founders of the company.

Possibly the outstanding feature of the new Sterling Viking Diesel is that the engine has the same installing dimensions as the Sterling Viking gasoline engine. Furthermore, the weight of the new Diesel is slightly under that of the comparative gasoline engine, in addition to which the power output is almost identically the same. These three accomplishments are outstanding and create a sizeable market for this new Diesel engine amongst the many, many users of Sterling Viking gasoline engines, who may wish to convert to Diesel and may now do so without making structural changes in their vessels or in the foundations on which their gasoline engines may be mounted. I would like to make this point clear. The Sterling Viking Diesel is not a conversion of the Sterling Viking gasoline engine. Rather it is a completely new Diesel engine designed and built from the ground up as a Diesel, but remarkably light in weight, compact in over-all size and very powerful.

Getting down to a detailed description of the Sterling Viking Diesel, it is a conventional type unit in so far as moving parts are concerned. It is a four-cycle, multiple cylinder, inline, trunk piston type machine, completely enclosed. The cast cylinder block is of single piece construction, containing the crankshaft main bearings at the lower surface with the wet cylinder sleeves inserted in the upper portion of the block. For easier handling, the cylinder heads are arranged individually for each cylinder and are attached to the top of the block.

The cylinder heads are provided with four valves per cylinder, two intake and two exhaust. They are actuated by push rods and rocker arms from the camshaft, which is located in the cylinder block and which is driven by gears from the free end of the counter-balanced crankshaft. The fuel injection system consists of individual injection pumps, one for each cylinder located close to the injection nozzle.

Other accessories are mounted in a compact accessories box, attached to the cylinder box and driven by the timing gears. All accessories may be readily removed without dismantling the engine.

The connecting rods are forged steel, rifle drilled for pressure lubrication to piston pins, and the crankshaft is also, of course, drilled for full pressure lubrication.

The camshaft is located in the cylinder block and is removable from side of engine. The main bearings, connection rod bearings, and camshaft bearings are precision type steel backed. Pistons are cast aluminum alloy provided with six rings and a full floating piston pin.

As stated above, the valve mechanism consists of dual intake and exhaust valves which are actuated by hydraulic lifters through push rods and rocker arms. Timing gears are helical, and are located at the forward end of the engine.

The bore and stroke for all models is 8 x 9 inches, giving a displacement of 2,714 cubic inches for the 6-cylinder unit and 3,619 cubic inches for the 8-cylinder unit.

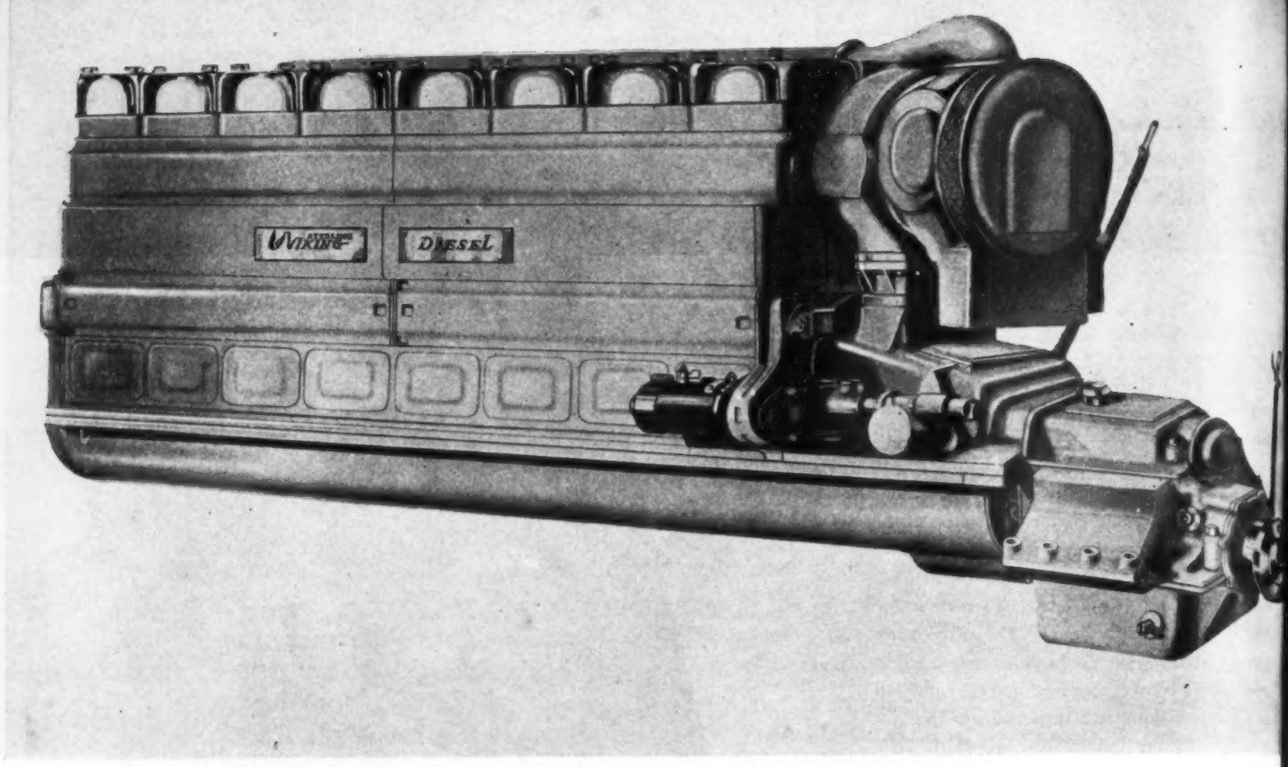
Marine engines are provided with a built-in reduction gear of any required ratio up to four to one, and on the marine engine the reverse gear is of the bevel gear planetary type with a multiple disc clutch operating in oil and arranged either for manual control or for remote operation by means of the Panish Control System.

The new Sterling Viking Diesel is electrically started by two 32-volt cranking motors situated on each side of the engine.

The lubricating system has been very well worked out and is modern to the last degree. It is of the dry sump type, has two oil pumps, one to draw the oil from the sump beneath the engine and the other to supply forced feed lubrication to all bearings, including the wrist-pin bearings.

Speed control is effected by means of a hydraulic governor having a wide range of speed regulation in the case of the marine type and having close speed regulation to meet all requirements in the case of the industrial and generator units.

A battery charging generator and fuel oil supply



Left side of the new Sterling Viking Diesel which is readily interchangeable with the Sterling Viking gasoline engines both as to weight, installing dimensions and power output.

pumps are, of course, provided and other auxiliary pumps and accessories may be attached to meet individual requirements.

As I went over the engine unit by unit, I was particularly impressed with the cast iron counterbalanced crankshaft, which provides for 6 in. main journals and 5 in. crankpins and yet because of the hollow type of construction keeps the weight of the shaft within reasonable limitations and provides exceptionally large journals and crankpins. The design of the oil pan or sub base is exceptionally interesting. Here nearly 1000 pounds in weight was eliminated as compared with the similar units on the Sterling Viking gasoline engine and yet nothing has been lost in rigidity and much has been added in heat transfer. Because I think many of you will be interested in how Hans Bohuslav was able to save a thousand pounds in weight in the oil pan for the Viking Diesel in comparison with the oil pan in the Viking gasoline engine, I went into this matter in some detail. I find that he used the Rigid-Tex design-strengthened sheet and it is the first time that I have seen this product used in Diesel engine construction. First of all, Rigid-Tex design-strengthened metals provide greater weight-carrying capacity than is normally obtainable from regular cold rolled flat material, as each pound of Rigid-Tex metal has increased strength-weight and increased rigidity-weight ratios through the ingenious, although scientifically sound, redistribution of metal. In the case of the Sterling Diesel oil pan, the original specifications, which called for cast iron, were first changed to 16 gauge hot rolled steel, which weighs 2½ pounds per square foot. Mr. Bohuslav then substituted an 18 gauge Rigid-Tex Design-Strengthened sheet (No. 6-WL), which weighs 2 pounds per square foot. This latter change provided an additional weight saving of 20% over the plain 16 gauge sheet, or 1000 pounds over the original cast iron pan. This particular design-strengthened pattern (No. 6-WL) provides an increase in section thickness of .040 in., or an increase of 80% in section thickness over plain 18 gauge sheet, without any increase in weight per square foot.

I was quite impressed with the pumps inbuilt on the engine consisting of separate gear driven self-priming centrifugal fresh water and sea water pumps. This is the first time that I have seen an application of self-priming centrifugal pumps to such service.

The supercharger is well mounted on the after end of the engine. It is exhaust driven and the exhaust manifold is water-jacketed. In operation this supercharger is exceptionally quiet and at 1200 rpm. the engine is extremely free from vibration and undue noise. All in all, I would say that Hans Bohuslav has designed a modern, efficient, quiet, clean looking Diesel engine, and he and his engineering staff are to be heartily congratulated.

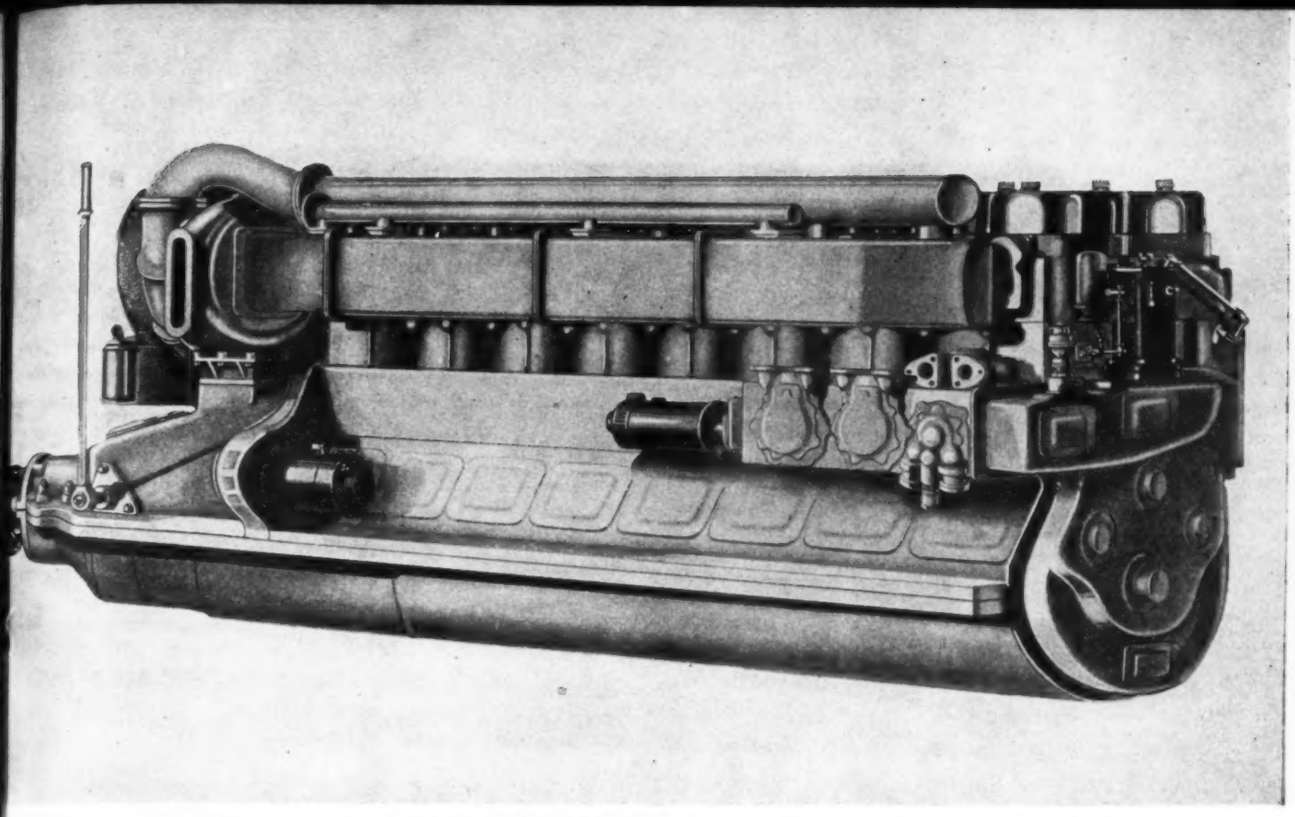
As I see it, the Sterling Viking Diesel will find a wide application not only in the marine industry but in many industrial applications, such as rail cars, switching locomotives, oil field drilling rigs not only for operating the draw works but also the mud pumps, for petroleum pipe line pumping stations, for electric generator sets, for driving water pumps, fire pumps, sewage disposal plants, flood control projects, mine ven-

HORSEPOWER RATINGS

	6 Cylinder Unsupercharged	*6 Cylinder Supercharged*	*8 Cylinder Unsupercharged*	*8 Cylinder Supercharged*
Continuous	275 hp. @ 1000 rpm.	410 hp. @ 1000 rpm.	365 hp. @ 1000 rpm.	550 hp. @ 1000 rpm.
Intermittent	325 hp. @ 1200 rpm.	495 hp. @ 1200 rpm.	440 hp. @ 1200 rpm.	650 hp. @ 1200 rpm.

WEIGHT

Weight with Reverse Gear	8,000 lbs.	8,500 lbs.	10,000 lbs.	10,500 lbs.
Weight with Reverse and Reduction Gear	10,000 lbs.	10,500 lbs.	12,000 lbs.	12,500 lbs.



Right side of the Sterling Viking Diesel which develops up to 650 hp. at 1200 rpm. when supercharged.

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Foote Bros. Gear & Machine Corporation	Timing Gears and Accessory Drive Gears
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Auto Engine Works	Reverse Gear
Summerill Tubing Co.	Injection Tubing
Woodward Governor Co.	Hydraulic Governor—Type UG
Thompson Products Co.	Linkage Rod Ends
Goulds Pumps, Inc.	Sea Water and Fresh Water Pumps
Gerotor Division, May Oil Burner Corp.	Lube Oil Pumps
Production Instrument Co.	Revolution Counter
Weston Electrical Instrument Corp.	Tachometers
Panish Controls	Reverse Controls
The Leece-Neville Co.	Starting Motors and Generators
The Timken Roller Bearing Co.	Thrust Bearings
Eclipse Machine Division, Bendix Aviation Corp.	Bendix Shafts for Starting Motors
National Jet Company	Drill Holes in the Spray Tips
The Chicago Rawhide Mfg. Co.	Oil Seals
Automatic Switch Company	Solenoid Safety Valve in Fuel Oil Header
Illinois Testing Laboratories, Inc.	Pyrometer and Thermocouplings
Manning, Maxwell & Moore, Inc.	Pressure Gages
The Meriam Company	Manometer for Intake Manifold Pressure
American Hammered Piston Ring Division Koppers Company	Piston Rings
Cleveland Graphite Bronze Company	Main Bearings; Connecting Rod Bearings; Piston Pin Bushings; Camshaft Bearings
Bacharach Industrial Instrument Co.	Chronomatic Drum Indicator
The Maxim Silencer Co.	Exhaust Muffler
Burgess-Manning Company	Intake Silencer
Commercial Filters Corp.	Fuel Oil Filters
Rigid-Tex Corporation	Oil Pan
The Electric Auto-Lite Co.	Batteries
Detroit Tube Products Company	Exhaust Manifolds; Intake Manifolds; Water Discharge Manifolds
Elliott Company	Superchargers
Campbell, Wyant & Cannon Foundry Co.	Crankshafts
Ohio Crankshaft Company	Machining of Crankshafts
Park Drop Forge Company	Connecting Rod Forgings
Muskegon Motor Specialties	Camshafts
The Weatherhead Company	Fittings
Scintilla Magneto Division Bendix Aviation Corp.	Fuel Injector

tilating fans, power shovels, cranes, air conditioning equipment and many other applications too numerous to mention at this time.

In developing this new Sterling Viking Diesel, the management has shown splendid foresight and judgment in adding a new line of engines to their regular models. A new line which will provide work for more men, for more machines, will in part answer Sterling's problem of how they are going to take full advantage of the plant facilities which have been added during the war. The addition of this new line naturally means that they will have post-war work for most, if not all, of the people who are now actively engaged in vital war production.

I was tremendously impressed with the manner in which the Sterling management has taken over this job of post-war planning and taken it out of the guessing stage and putting it onto a firm foundation—putting it onto a base from which they can immediately start operations when the stop order comes from Washington, on the engines which they are now building for war work.

In other words, to a very marked degree, Sterling has been able to quietly carry on a very important development program for a new post-war product, without in any way disturbing or interfering with their war production. I only wish that more companies in this country were in a similar position.

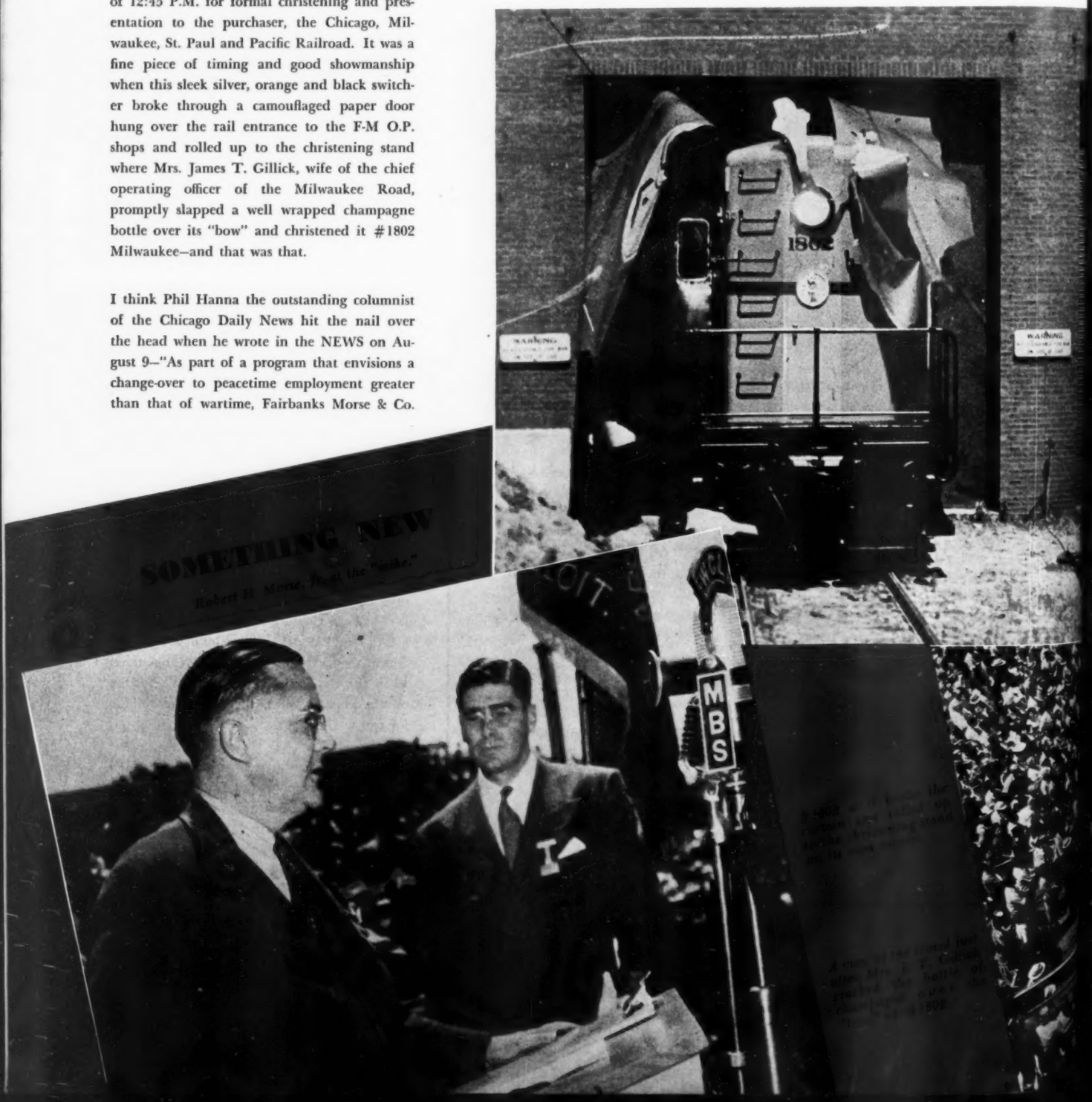
By REX W. WADMAN

BELOIT, WIS., August 8. Something new was added today to the postwar Diesel picture. Fairbanks Morse & Company unveiled their first Diesel locomotive to a crowd of six or seven thousand employees plus four to five hundred prominent guests from practically all sections of the country. It was a representative and intensely interested group of people.

The first F-M built Diesel locomotive roared out of the shop here this afternoon on the dot of 12:45 P.M. for formal christening and presentation to the purchaser, the Chicago, Milwaukee, St. Paul and Pacific Railroad. It was a fine piece of timing and good showmanship when this sleek silver, orange and black switcher broke through a camouflaged paper door hung over the rail entrance to the F-M O.P. shops and rolled up to the christening stand where Mrs. James T. Gillick, wife of the chief operating officer of the Milwaukee Road, promptly slapped a well wrapped champagne bottle over its "bow" and christened it #1802 Milwaukee—and that was that.

I think Phil Hanna the outstanding columnist of the Chicago Daily News hit the nail over the head when he wrote in the NEWS on August 9—"As part of a program that envisions a change-over to peacetime employment greater than that of wartime, Fairbanks Morse & Co. this week celebrated the unveiling and christening of its new Diesel powered railroad switching locomotive.

******The event and the creation of the new engine was made possible by the Navy's granting this company permission to divert the engine from the submarine program, for the plant has been on a 100% war basis. It is, incidentally a splendid demonstration of how a war plant, making a product that has peace time uses, can take the initial steps in dovetailing its war program into its peace program. By doing so it helps to minimize the unemployment gap incident to fully completing a war program before changing over.



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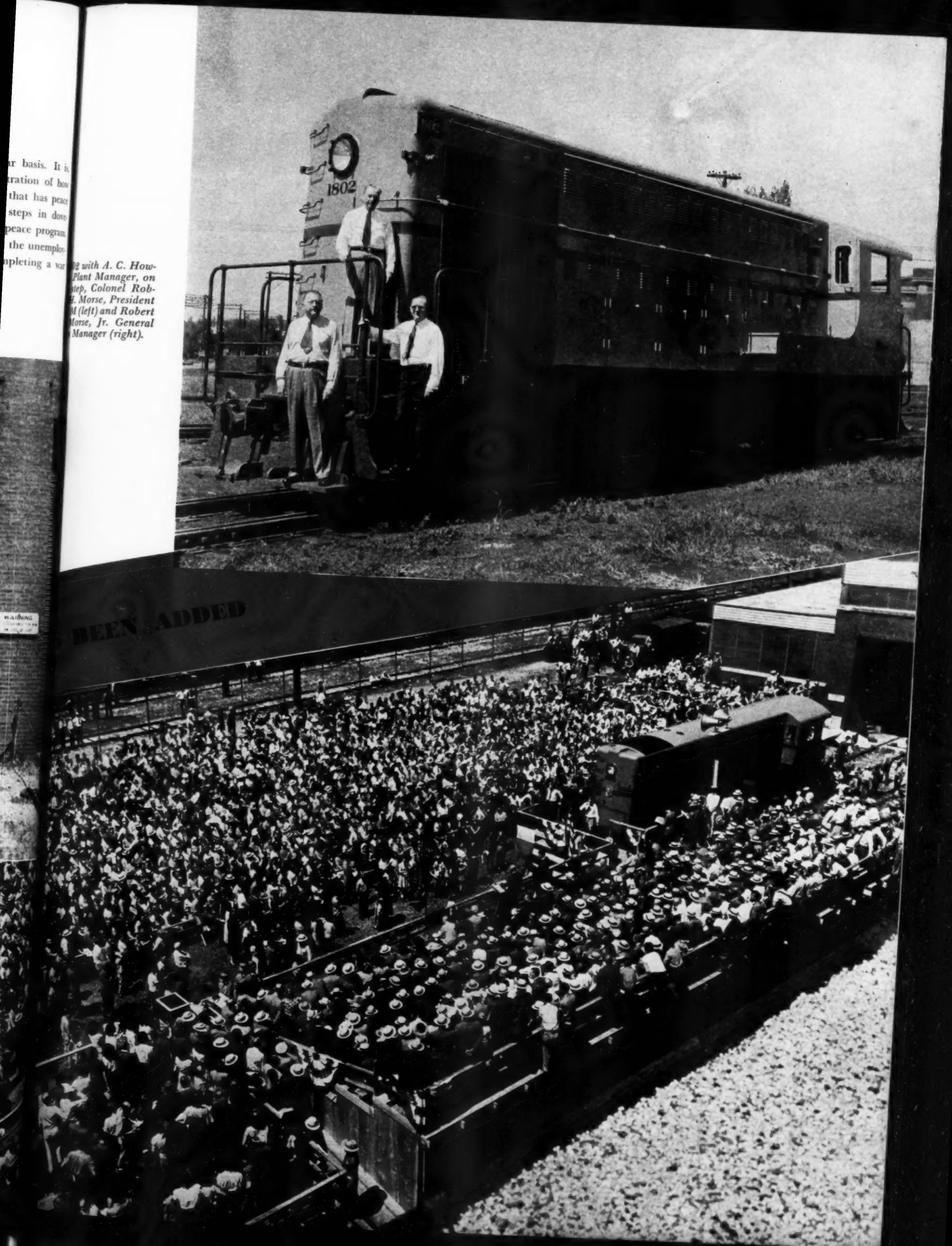
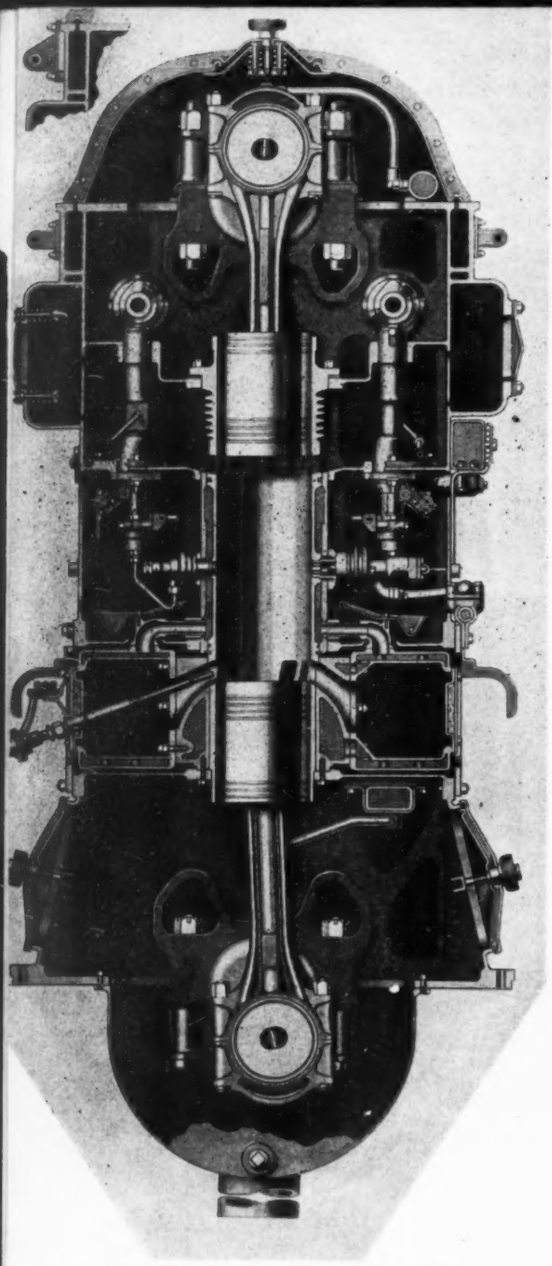


*g with A. C. How-
Plant Manager, on
tep, Colonel Rob-
H. Morse, President
M (left) and Robert
Morse, Jr. General
Manager (right).*



Cross section of Opposed Piston Fairbanks Morse Diesel Locomotive Engine.

******There was something unusually heartening in this spectacle. Its theme was not the orthodox one of how much business are we going to do and how much earnings per share can be made. From the highest official to the lowest the theme was—How many postwar jobs can be made and how many new fields of activity can be opened" So wrote Phil S. Hanna and I heartily re-echo his statements.

To get back to the locomotive itself. #1802 is a 120 ton, 1000 hp. Diesel electric switcher which at 30% adhesion has a tractive effort of 72,000 lbs. Weight on drivers, loaded, ready for service:—240,000 lbs. Maximum working speed:—60 mph. Fuel oil capacity:—720 gallons. Lube oil:—140 gallons. Engine cooling water:—100 gallons. Single bearing Westinghouse traction generator is connected to engine through flexible coupling. Four Westinghouse traction motors with forced ventilation and single reduction gearing, are axle hung.

The Diesel engine is a bit different from what most of us have become accustomed to—it stands on top of itself. It is a vertical, six cylinder, two cycle, opposed piston unit rated at 1000 bhp. at 800 rpm. Idling speed 300 rpm. The cylinder dimensions are 8⅛" diameter and 2 x 10" stroke. Principal characteristics (I might state that a detailed description of this opposed piston engine, with cross sections and full specifications appears in the 1944 edition—volume Nine—of the Diesel Engine Catalog, which is now available) include a one piece welded steel cylinder block; two ample size crankshafts, each with eight main bearings. Two pistons operate in each cylinder in opposite directions. They are of the trunk type, semi-steel, cooled internally with lubricating oil and equipped with cast iron piston rings. Piston pins are carried in separate inserts.

A direct driven fuel oil supply pump takes the fuel from the day tank and forces it through filters into the fuel headers connected to the injection pumps. Each cylinder is provided with two fuel injection pumps and two injection nozzles located on each side of the cylinder block.

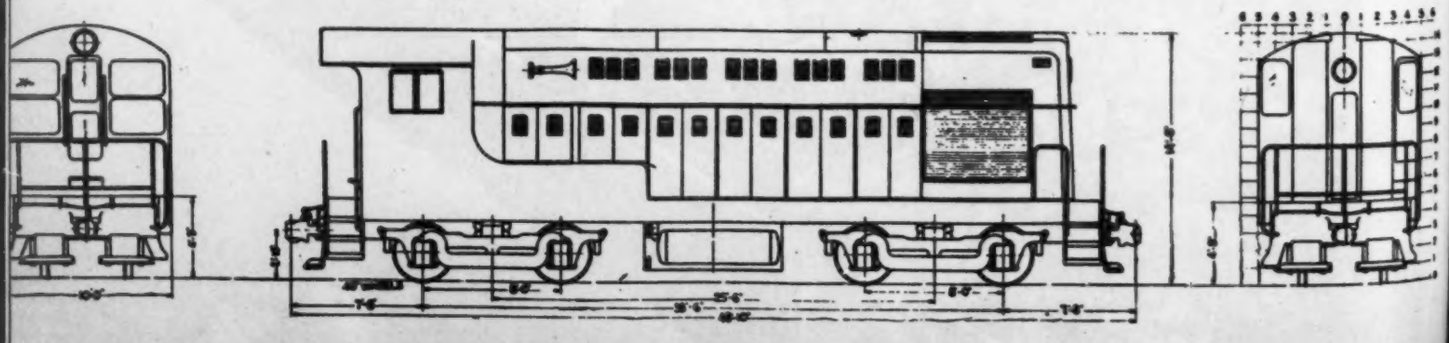
A Woodward hydraulic type governor is used. Engine speeds between 300 and 800 rpm. are controlled by the engineer's throttle. A separate over-speed governor is inbuilt into the unit.

In design and construction its the submarine engine in all but rating and over-all size. Its a tried and proven unit and can be depended on to give a good account of itself in service.

Fairbanks Morse & Company have embarked on this railroad locomotive business in a big way. They propose to offer this 120 ton switcher and also passenger and freight locomotives using the 2000 hp. opposed piston engine as the unit power plant. In appointing John W. Barriger as head of the newly created Diesel Locomotive Sales Division, they obtained the services of a man who really knows the railroad business. In his early days he served with the Pennsylvania Railroad, then headed RFC's Railroad Division from 1933 to 1941 and has been associated with the Carrier's Conference Committee in 1941 and 1943 wage cases. He has been a director of the Alton and Reorganization Manager of the C. & E. I. R.R. and an Associate Director of ODT.

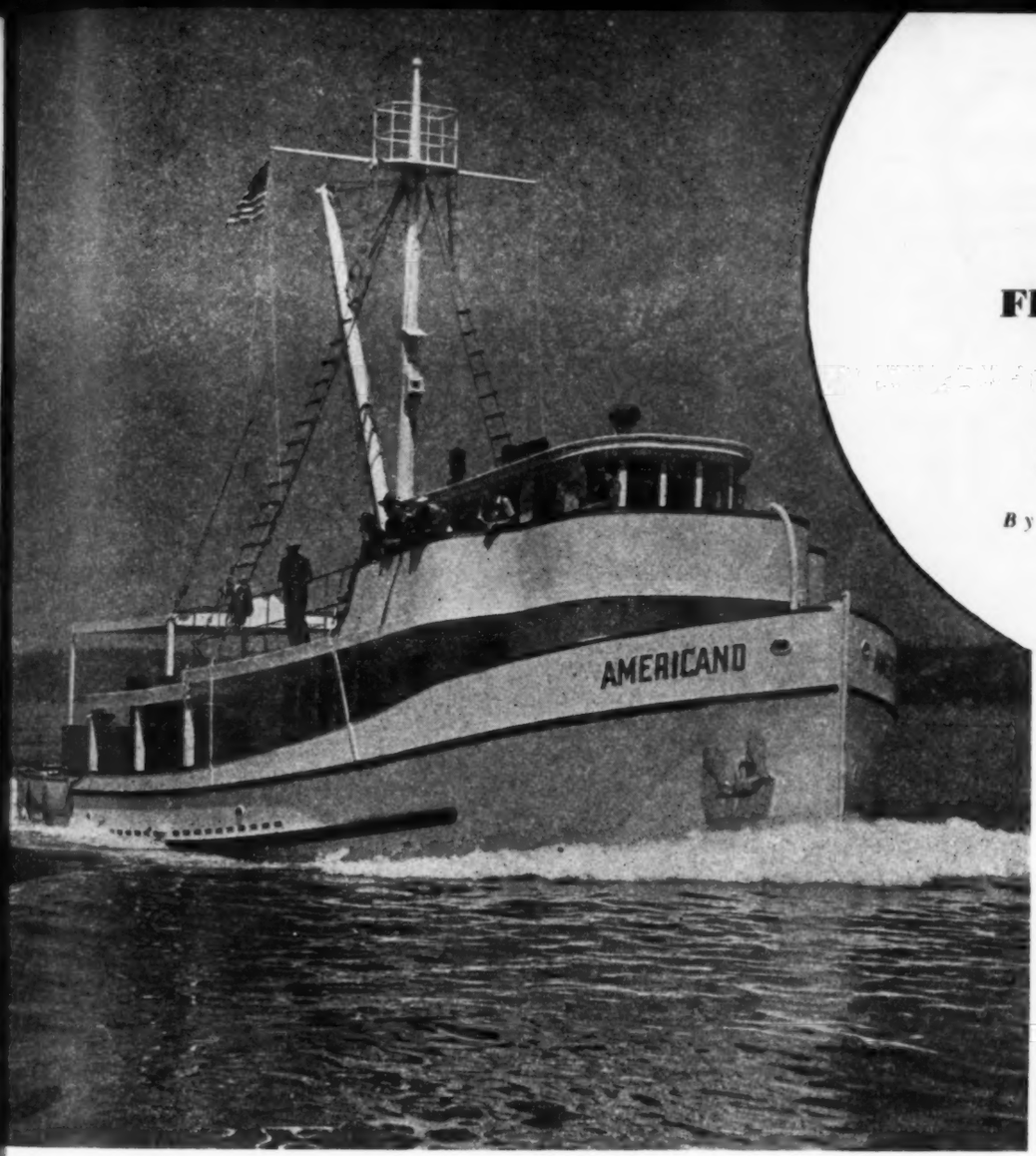
He knows his way around. Young, aggressive, splendidly trained in financing and railroading. He'll go places with F-M which has two bright young men of their own in A. C. Howard as Plant Manager and Robert H. Morse, Jr. as General Sales Manager. I will say this, I think there will be more than enough locomotive business available during the next five years to keep Electro-Motive; Alco, Baldwin and F-M plenty busy.

Plan view of the Fairbanks Morse Opposed Piston 120 ton, 2000 hp. Diesel Locomotive.



POSTWAR DIESEL FISHING FLEET ALREADY A-BUILDING

By CHARLES F. A. MANN



View of the Diesel tuna clipper "Americano" on her trial trip.

LAST month we reported from the "Western Shipbuilding Front" that Northwest boatbuilders were practically all geared up to turn out fishing and commercial vessels and they had all stopped worrying about what would happen "when the War Ends" . . . a familiar topic of Tavern Worry throughout the USA this Summer.

In Tacoma, where over 100 large wood and Diesel Army and Navy vessels have been produced during the past 36 months, and possibly another 50 of assorted smaller types for the Government, actual conversion to private construction has taken place and by October, 1944, what would in a normal peacetime year be considered a good seasonal production of boats, will have become an actuality. Approximately 15 large fishing craft are scheduled for completion this season.

Characteristic of the output is the so-called "Giant" type purse seiner and the "Baby Clipper" type of smaller tuna vessel, the latter somewhat of a novelty due to its exceptionally compact design and high capacity, in spite of the heavy layout of machinery and pumps necessary for a brine-type system of storing fish.

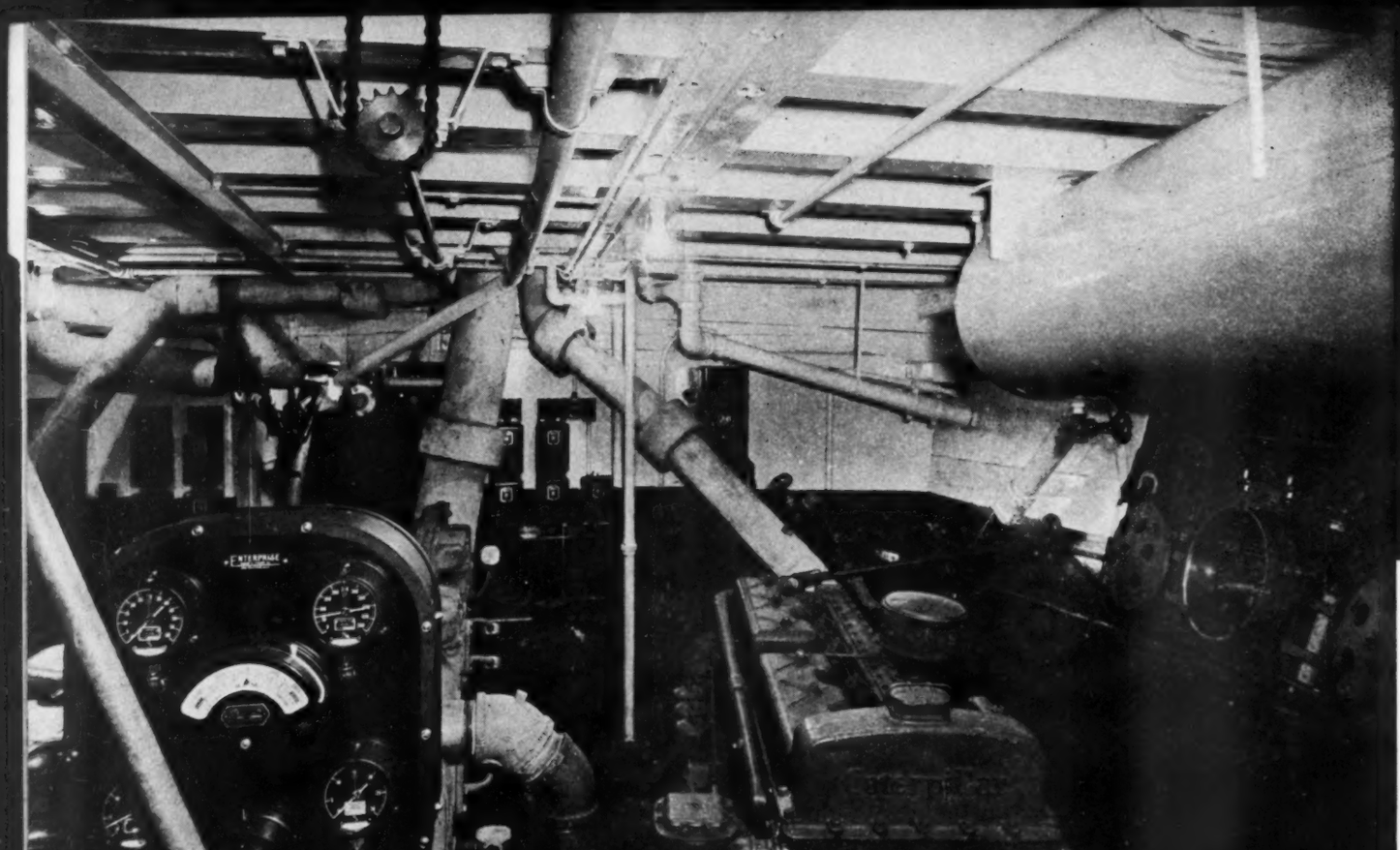
Everything found on a big 135 footer is to be had on this type of "Baby Clipper," and nearly 150 tons capacity of frozen tuna are possible by synchronized usage of bait tanks and two fuel oil tanks in addition to the regular refrigerated fish holds.

One of the newest if not the very first of these small tuna clippers was finished in July and sent off to San Diego and Los Angeles Harbor, via Astoria, Oregon, for Capt. Donald Morgan and his Associate-Partner, Van Camp Seafood Company.

Americano is the name of one of the unique Diesel vessels built at Tacoma in the past four years, having a complete layout of pumps, two Diesel auxiliaries, a main Diesel and full electric driven auxiliaries and refrigeration pumps, with a capacity of 145 tons of fish and a crew of 10 besides, all in eighty-seven feet of length!

Heavily built of Douglas Fir, *Americano* carries her machinery far forward under the pilot house, has a broad bow and a huge squat, square stern with almost the capacity (and buoyancy) of a medium size barge. Heavy ribs and large one-piece extra thick keel, caulked single-thickness fir planking, rubber covered driveshaft, and with a liberal use of Douglas Fir plywood in not only the deckhouse but below for ceiling and tank covering, the *Americano* is a splendid product of the Peterson Boatbuilding Co. of Tacoma, and embodies the war-born necessity for ingenuity to a degree never before seen.

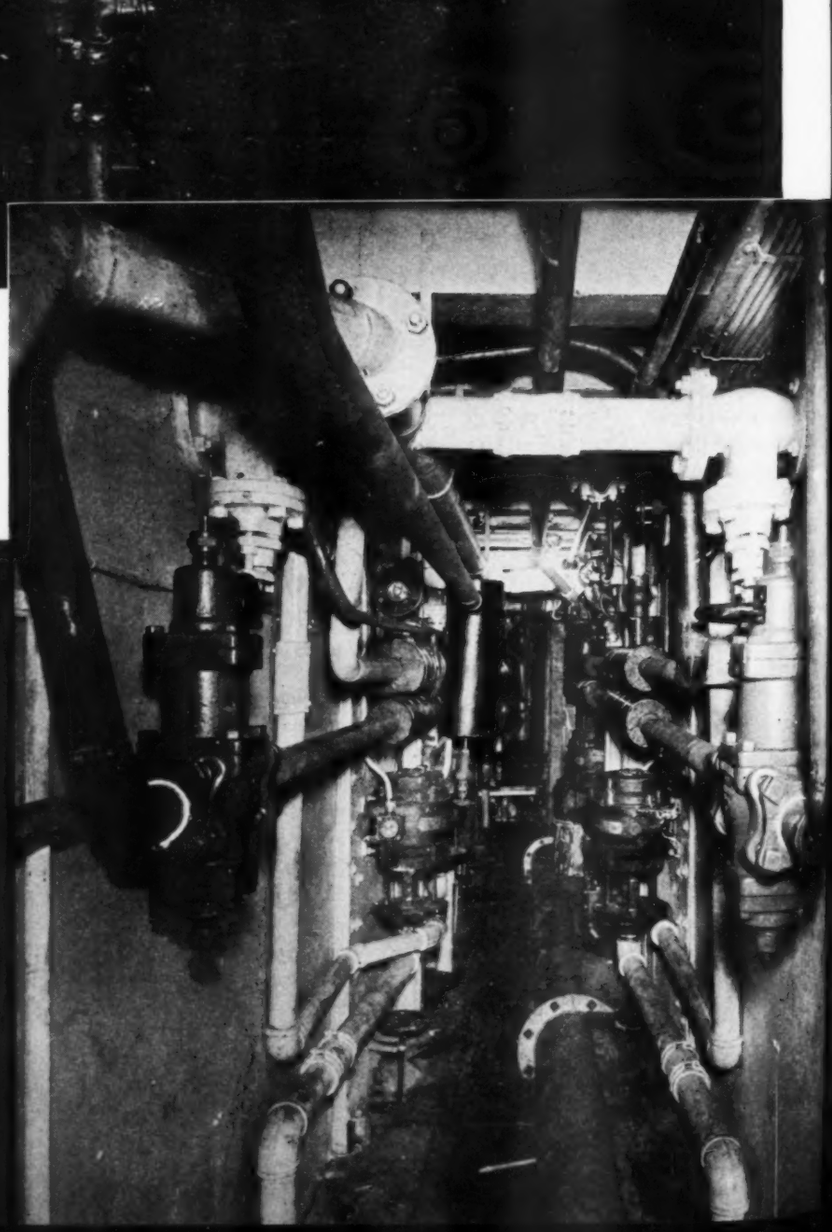
All the machinery in this 87 ft. hull normally occupies at least a 125 ft. hull, with the same carrying capacity. The vessel is 87 x 22 x 12, with 14 ft. loaded draft aft. At this loading, generally on the homeward trip with everything including the after deck full of precious tuna,

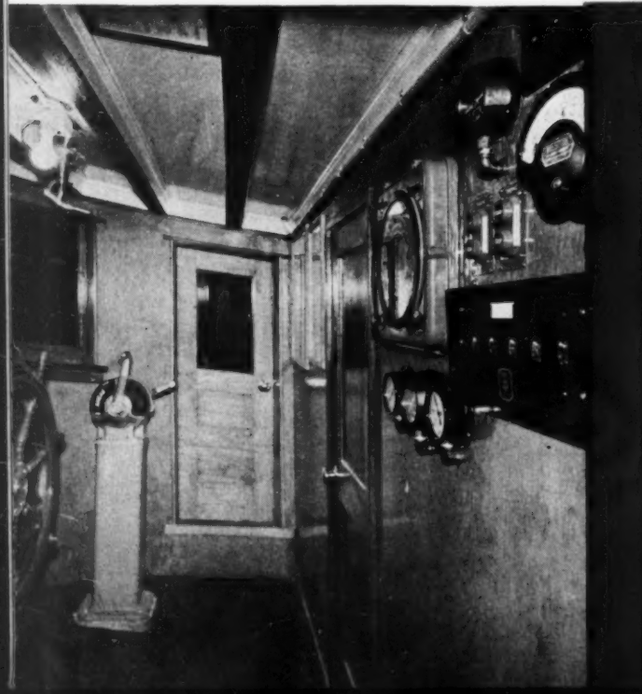


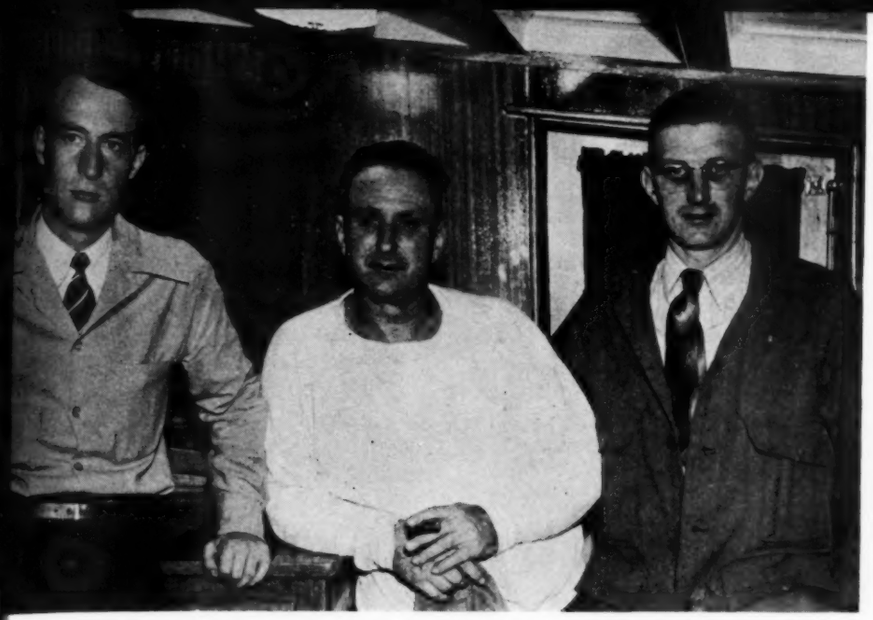
Above: Engine room view on the "Americano" showing one of the two Caterpillar auxiliary Diesels and the Enterprise main Diesel instrument panel with Weston tachometer and Alnor pyrometer.

Right: View of the shaft alley into which is crowded all circulating pumps, piping headers, valves, tailshaft, steering shaft, CO2 lines and light cables.

Below: Pilot house view showing engine room telegraph, gauges and Weston tachometer.







Left to right: Fred Dyment, Manager of Peterson Boatbuilding Company, Captain Donald B. Morgan, Skipper and part owner of the "Americano" and George Peterson, President of Peterson Boatbuilding Company.

the whole after deck is almost awash. In fact a short part of the voyage, if tuna is running and it is not far from port, the after deck may be piled high with fish and actually run awash! The design of the hull is essentially the same as the *General McArthur*, reported in DIESEL PROGRESS two summers past. The engine room forward, actually begins with the chain locker, and features a 400 hp. 12 x 15 in. 4-cycle heavy duty, medium speed Enterprise 6 cylinder Diesel engine, direct connected to the propeller, and direct reversing. The Diesel operates at 400 rpm. maximum speed and is coupled to a Doran 3 bladed 62 x 41½ inch bronze propeller, with built-in thrust bearing. The heavy auxiliary power load is furnished by two 115 hp., 6-cylinder Caterpillar Diesels, driving 75 kw. A.C. generators. To cut down weight, no storage batteries are provided, and at least one of the Caterpillars must run constantly from the time the ship leaves port until it returns with a full load of frozen tuna.

Everywhere ingenious strip-aways of conventional "gadgets" is noticeable to cut down weight. Fresh water is limited to but 1600 gallons, with 800 of this in a flat welded steel tank occupying a thin, wide area under the entire galley floor. Two 400 gallon water tanks are fitted far aft.

Engine control panels for the Caterpillar Diesels are fitted directly on the front of the engines and the Enterprise Diesel has its control panel duplicated in the pilot house, with instrument panel, including a Weston tachometer and Alnor pyrometer fitted below. Two welded steel 22 x 84 inch air bottles are carried on the engine room ceiling for starting. Maxim exhaust silencers are fitted on the Caterpillar Diesels.

Directly above the engine space, on the top deck is the pilot house with full pilot house control. An instrument panel on the bulkhead contains special bilge, low oil, and emergency alarm system; pressure gauges, a fathometer, a Weston tachometer and a square D control panel to operate bilge pumps and shut down the main or auxiliary Diesels.

Immediately aft of the engine room is the long shaft alley that runs between the two rows of fish tanks. Here are fitted eight 3 in. Fairbanks Morse vertical brine pumps, with the necessary maze of transfer valves. Each pump is operated by a 3 hp. motor. A 3 hp. Baker ice machine is carried in the engine room for the large refrigerated galley ice box, in addition to a 3 in., 5 hp. sludge and bilge pump and a 1 in. F.M. bilge pump. The original Enterprise air compressor off the main engine was removed and set up as a separate auxiliary with its own 5 hp. motor. A 6 and 8 in. Fairbanks Morse vertical bait pump is also carried in the engine room.

Lining the outside of the shaft alley-pump room are eight fish tanks, heavily insulated. The forward tank on each side is lined with steel and used to handle 4500 gallons of fuel oil for the outbound trip only. Each of the eight tanks are lined with galvanized ammonia coils, as well as the 3-section bait box on the covered aft main deck. When fishing, the fish are caught and dumped into one of the tanks and brought down to 20 degrees, and when frozen solid, the brine is pumped out and the dry, hard frozen tuna are stored like cordwood in the refrigerated compartments which are held to about 25 degrees. This cycle is repeated until the lower tanks are all full—except the two with Diesel oil, then the bait tanks are cleaned and used one by one for storing frozen tuna. When two of them are full, one of the fuel oil tanks is cleaned, the refrigeration turned on and it is stored; then the second fuel oil tank and finally, with bait used up, the last bait tank is filled with frozen fish and the *Americano*, fuel almost gone, fresh water gone, bait gone, but with 145 tons of priceless tuna, worth from $210 to $450 per ton, scoots for her home port. All that has to keep running are the three Diesels to make the entire voyage an economic success.

Even the crew cooks, eats and bathes in salt water . . . the semi-warm South Pacific salt water, and a special salt-water soap is used—even for washing dishes. Just about enough fresh water is carried to cook certain foods that won't stand seawater, and to drink! This saves weight, and every ton of weight saved is another $400 worth of fish!

Hand-operated, lightweight worm drive shafting is used on the steering mechanism; a Deluxe Oil Burner for the Ingle galley range (no hot water boiler either—this wastes water, takes up space and adds weight). The luxurious captain's room is panelled in mahogany, done up with linoleum and bright drapes, and is aft of the pilot house, while space for a crew of 10 is fitted forward of the galley, and directly aft of the refrigeration space, located directly under the pilot house and directly above the engine room, at the forward end of the main deck.

Here are to be found 3 sets of 2-cylinder Kohlenberger ice machines, using ammonia, and the direct-expansion system of coils, feeding into the 11,000 feet of galvanized welded steel refrigeration tubing in all the fish carrying spaces. Each is driven by a 20 hp. Fairbanks Morse motor and crammed back of them is a little 4-bottle CO_2 system for protecting the engine room. A Johnson anchor windlass and a 10 hp. geared motor boom winch, fitted aft, plus the usual shelter deck, flood lights, welded steel racks for use in fishing over the side, aft, and the crows nest atop the mast.

An ocean liner in miniature is the *Americano* and in spite of her cost of $140,000, she will earn quick profits and be in a perfect postwar competitive position with the larger clippers of the Southern Pacific coastal tuna fleet.

DESERT DELIVERIES DEPEND ON DIESELS

By JIM MEDFORD

DESERT wastes of California and Arizona are not what they used to be. The desert rat and his burro are almost museum pieces. And where they once plodded their silent way, giant war birds circle the clear blue of the desert's dome and fire-spitting tanks rumble through terrain that but yesterday was the abode of jacks and horned toads and road-runners on their everlasting snake hunts.

This changing world is the cause of it. These planes and tanks are only temporary dwellers of the sand and cactus land. But while they are there, their bellies need fuel—more and more fuel. And to get this needed fuel to the bomber and training centers, the Diesel tank truck is the nursing bottle for these babies.

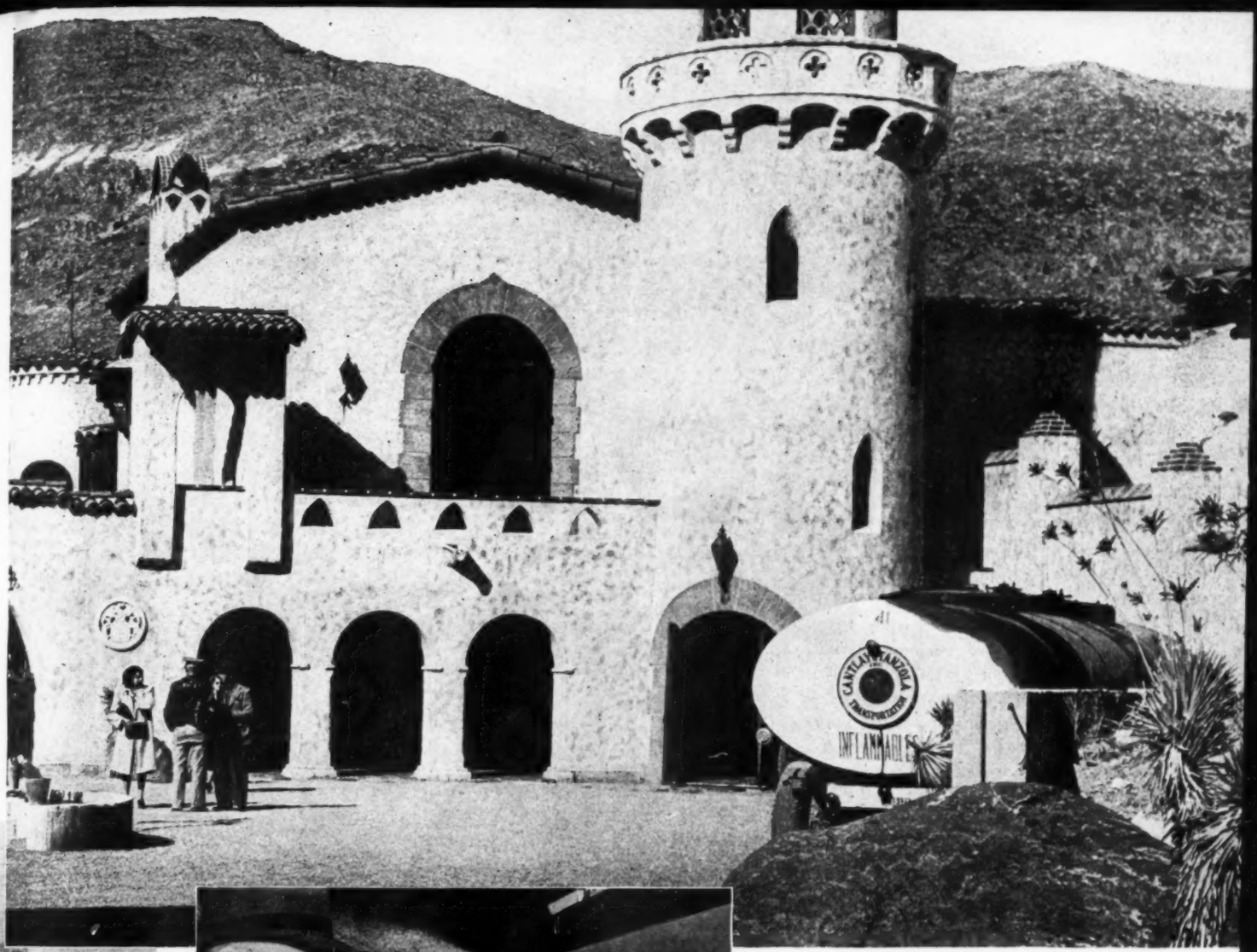
Some of the hauls from the refineries are as short as 114 miles for the round trip. Other hauls to the more remote Arizona desert sections require 1,400 round-trip miles of travel. To handle these long line hauls with the 7,200-gallon equipment, the Automotive Diesel is superior to anything yet put in a truck to get it there and back with efficiency and low operating cost.

Out of Los Angeles on the runs to thirty Arizona desert points, the way is via Blythe where the relief driver takes over for the concluding leg. Blythe is 229 miles and nine hours under the limited speed regulations from the initial point. At Blythe the drivers swap road equipment and sleeping quarters, the relieved drivers turning in in the "submarine" vacated by the relief man.

For those unacquainted with the desert *idioma*, a "submarine" is a double roofed cabin or string of cabins with a flowing sheet of water across the lower metal roof for cooling. With the electric fans turning inside, the interior is quite comfortable. These and air-conditioned living quarters make summer temperatures of 130 degrees bearable.

East and south from Blythe the relief man rolls his ten thousand dollar road train holding more than two thousand "A" coupons (Western kind) of gasoline. He pushes on for ten hours, then ties up at some roadside beanery for eight hours in the hay. Then, with a feed under his belt, he rolls on into the rising sun. At the end of the run, unloaded, he returns to Blythe and turns over to the Los Angeles man the 76,400-pound two-unit train rolling on two tons of Jeffers doughnuts and takes his turn in the "submarine".

One contract carrier, the Pacific Tank Line, operating twenty-seven Cummins Diesel truck and trailer units of 7,200-gallon capacity will this year roll 2,380,880 miles to provide 58,000,000 gallons of 73 to 100 octane gasoline to desert bases. These tankers move over the high-



Death Valley Scotty's castle receives a load of fuel oil from the Cummins Diesel engined tanker, right foreground.

The driver of a Diesel tanker checks his Sangamo electric recorder that registers mileage, speed, time running and time idling; also tells time.

An old timer in the petroleum transport business—a Sterling truck with a Caterpillar Diesel engine carrying 2035 gal. in truck tank and 2947 gal. in trailer tank on the run from oil field to refinery, Gato Ridge, near Santa Maria, California.

ways the twenty-four hours through to fuel a total of ninety points scattered over an area that is high and cold and low and hot and bigger than many a European country.

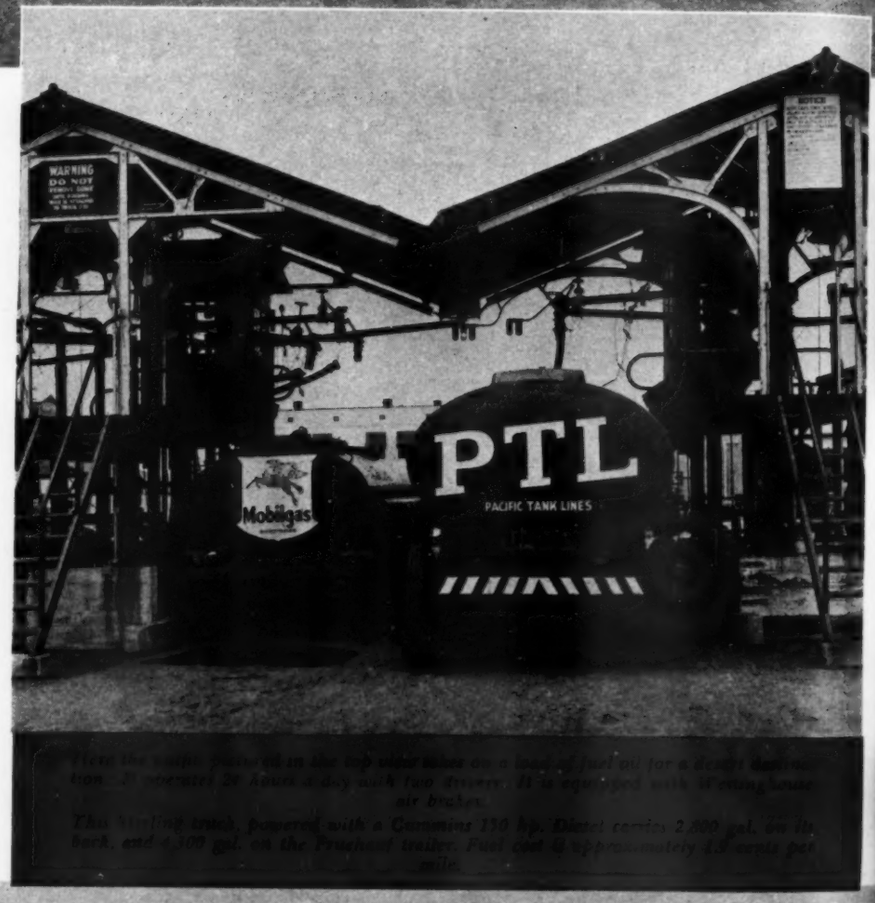
To move this gas, sufficient to fuel a "flying fort" on 2,154 round-the-world flights and in amount to release 5,800 badly needed railroad tank cars of 10,000 gallons, with twenty-seven power units and twenty-seven trailers blasts wide open the theory of some Washington "experts" that highway transports are not essential war or fighting equipment. Like a "cat" in the timber country, these Diesel trucks go where nothing else can or will attempt, deliver, and do it over again 365 days in this or any other administration's year.

If you're still skeptical that trucking hasn't come a long way in this southern area in twenty years of long distance hauling, take a look at what was considered tops two decades ago: Then a Pierce-Arrow truck and trailer

A modern tank transport outfit belonging to Pacific Tank Lines, Los Angeles. It is a Kenworth truck with Cummins 150 hp. Diesel. The outfit weighs 76,400 lbs. and is valued at $10,000.

weighing 27,000 pounds had for power a gasoline engine of *twenty-two* horsepower, turning 2,300 rpm. And burning a gallon of acid-cut fuel each 3½ miles, the outfit "speeded" along at a top speed of *eighteen* miles. The speed limit for those rubber tired transports was *twelve* miles. Many drivers got a ticket for making *thirteen* in town.

Then the carriers were on their own, sink or swim. They never had Uncle Sam looking over their shoulders in the person of the WPB or the ODT. But now they're something like the Valley rancher who was trying to get shipment of some badly needed chilled steel plowshares to put his land in shape for sugar beets. A bright laddie in the ODT replied, saying: "The shipment is held up for lack of refrigerated shipping facilities." Understanding: what?



View of a

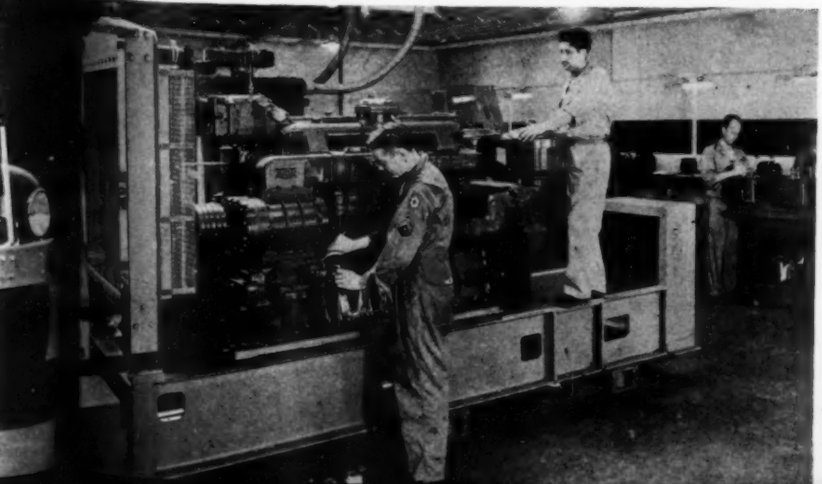
View of

View of a section of the Buda Diesel School shop showing students at work on job assignments.

Howard Burmeister, instructor in the Buda Railroad Diesel School.

Students at work on Diesel intake air equipment.

View of students working on walk-up of Whitcomb locomotive Diesel engine.



NEW DIESEL SCHOOL AT BUDA FOR ARMY BATTALIONS

THE school was set up for the U. S. Army Railroad Operation Battalion and Maintenance Battalions. A company of men comes in every week for extensive training on the operation of Diesel engine which is used in the Whitcomb locomotive. Extensive training is also given in engine maintenance for the Railroad Operating Battalion, operating in the repair shops or roundhouses of the Army. The training consists of one day of lectures on the principle of the Buda Diesel engine. The other five days are spent in the shop working on shop assignments, consisting of fuel systems, lubricating systems, cooling systems and operation and maintenance of the Model 6-DCS-1879.

New Husky foom

No job rates tougher than landing on an enemy shore, establishing a beachhead and following up with plenty of supplies.

It takes dependable support by all kinds of landing craft.

Hundreds of such craft, including the new LSM (Landing Ship Medium) shown here, are powered with General Motors Diesels.

These engines are meeting the exacting demands of war in all parts of the world. They are always ready to go.

GM
GENERAL MOTORS
DIESEL POWER

ENGINES..*150 to 2000 H.P.* **CLEVELAND DIESEL ENGINE DIVISION,** *Cleveland 11, O.*

ENGINES..*15 to 250 H.P.* *DETROIT DIESEL ENGINE DIVISION, Detroit 23, Mich.*

LOCOMOTIVES. . . . . *ELECTRO-MOTIVE DIVISION, La Grange, Ill.*

KEEP AMERICA STRONG ★ BUY WAR BONDS

...one of War's Toughest Jobs

View of the Wye at junction of main line and Northern extension of the Western Pacific in the deepest part of Feather River Canyon.

DIESELS ON THE FEATHER RIVER ROUTE

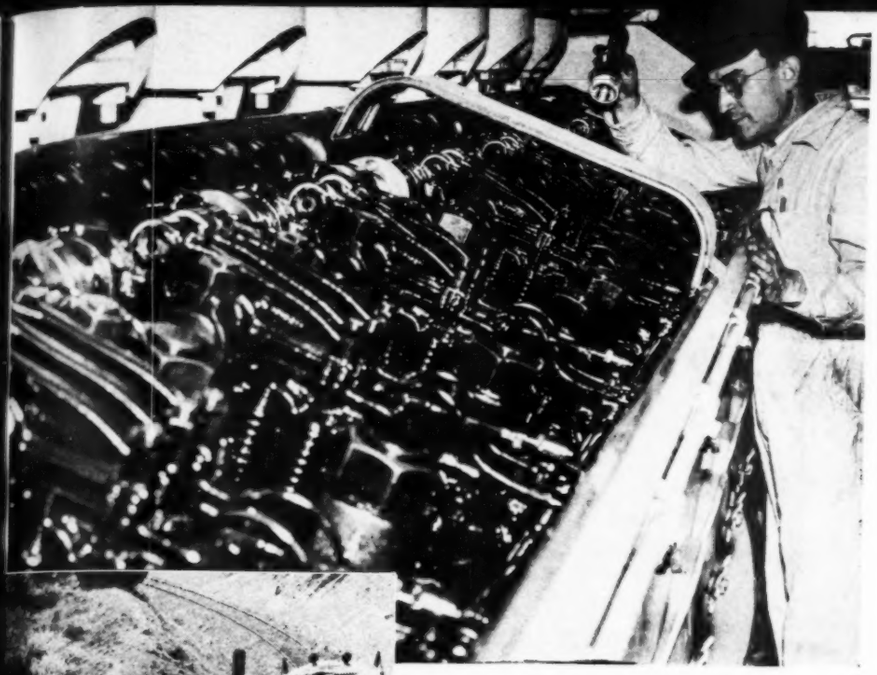
By CHARLES F. A. MANN

HIDDEN in the vast desert and mountain country of Utah and Nevada, and deep in the bottom of Feather River Canyon, spectacular 117 mile gash in the Sierra Nevada mountains in northeastern California is one of the practically unsung railroad epics of the 20th Century, the Western Pacific.

Connecting Salt Lake City with San Francisco, the 928 miles of Mainline belonging to the Western Pacific Railroad Company comprises one of the most important links in the whole American transcontinental railway picture. Not only is Western Pacific the very "Last" of the Western Trancontinental lines, having opened for business for freight in 1909 and passengers in 1910, but by virtue of a daring $14,000,000 piece of heroic construction completed in 1931, at the eve of the Depression,—the 112 mile Mountain line between Keddie, deep in Feather River Canyon, and Bieber, on the high plateau of Northeastern California, plus 88 additional miles to Klamath Falls (G.N.), Western Pacific is also the connecting link in the Pacific Coast's only competing North-South mainline in the entire region North of San Francisco.

Unlike most all other American railroads, Western Pacific was born of a clear, single-purpose vision to unlock the Salt Lake Gateway, in one fell swoop, so to speak.' The Gould railroad empire had long dreamed of a *really* Trans-continental main line stretching from the Ohio River to the Pacific at San Francisco. When they had finished rebuilding the Rio Grande and arrived at Salt Lake, the Goulds found the Western Gateway locked against them, and it meant forcing an unwilling competitor to take Westbound freight from the Rio Grande and forcing an even more unwilling competitor to

Western Pacific's E-MC Diesel locomotive No. 901 going into Williams Loop. Dynamic brakes



Inspecting the gear mechanism with top cover removed from one of the E-MC locomotive Diesels.

(note grids) ease trains downgrade for 100 miles without use of air brakes.

divert freight Eastbound at Salt Lake—two things almost impossible to achieve, human beings what they are! So, the American Way chose to press competitively Westward, and following the pioneer surveys of Arthur Walter Keddie in Feather River Canyon and through Scout Jim Beckworth's low Pass east of Portola, the Goulds laid out their plans starting in 1900. By 1905 construction was underway on a brand new railroad and its far-sighted Founding Fathers had a clause put in the Mortgage Indenture which provided a "Standard gauge railroad with curves not to exceed 10 degrees and grade not to exceed 1% to be constructed from Salt Lake City to San Francisco." Time has proved the value of this wise decision, and though the 117 mile Feather River Canyon cost more per mile than any other railroad ever built on the North American Continent, today, in the midst of a Global War, 25-year-old steam Mallet engines can haul 3300 tons up the canyon from practically sea level to the Sierra Summit and big 5400 Hp. Diesels can yank 4,000 tons up the same grade faster and without a helper.

Western Pacific was not a merger of smaller lines or a reconstructed version of leftover shortlines, and today, with its vital San Francisco-Salt Lake City line and the Bieber connection with the Great Northern, it stands as the one truly "Bridge Railroad" in the whole Far West. Affiliated with it are the Sacramento Northern and Tidewater Southern, feeder lines radiating out of Sacramento. Two branches are all that are worthy of special note, the San Jose, Cal. branch and the little hillbilly line down to Reno. The rest of the entire System is based on the short North Line and the long East Line, and boasting of the most compact, industrious little railroad "family" of any Western line, this once unknown System is now handling annually over 10 billion gross ton miles in freight service or an increase of 100% since 1939, and at the same time is handling passenger service car miles nearly 200% above 1939.

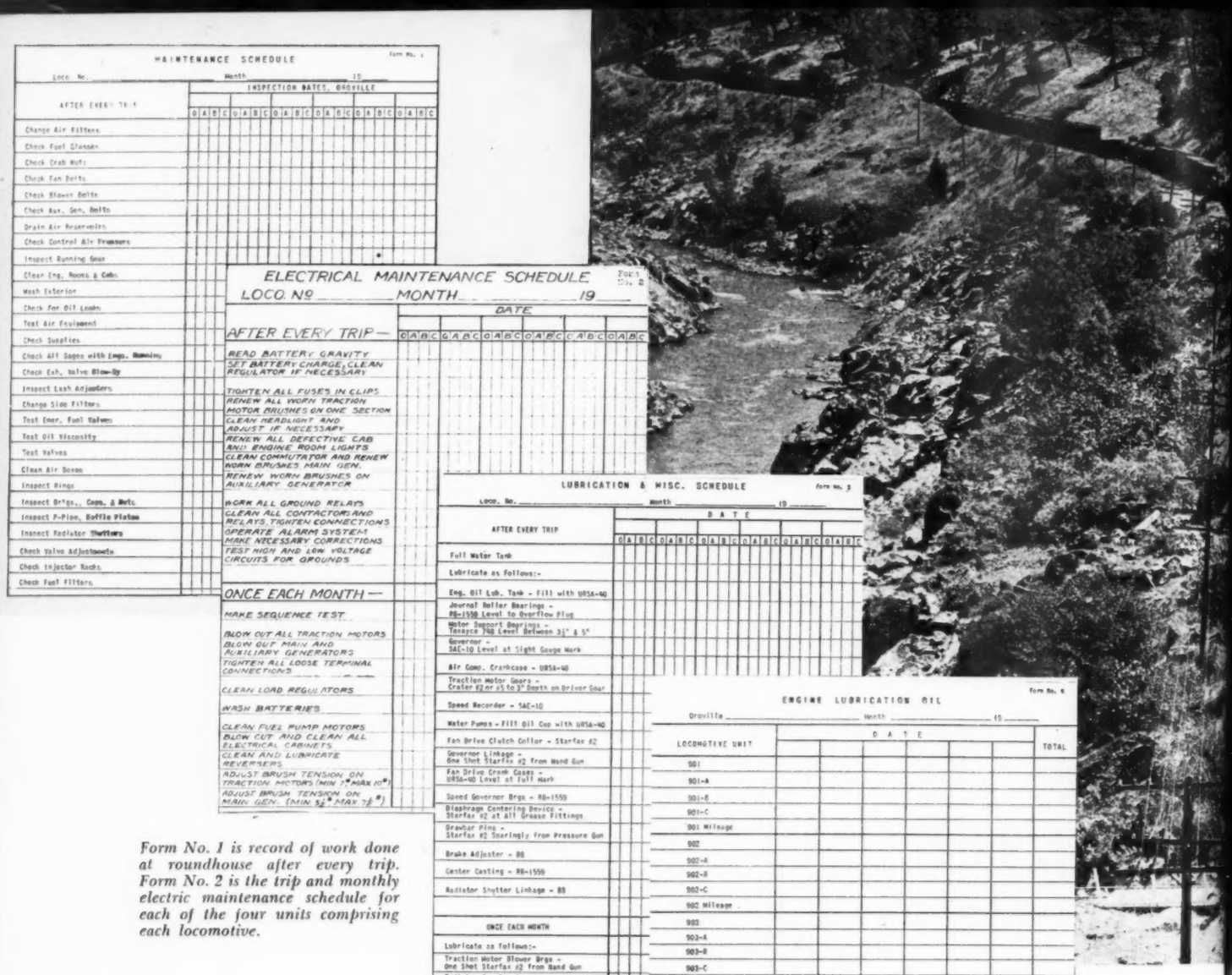
A mighty contribution to the War effort, and at times almost the sole savior of a serious Northern California freight blockade, Western Pacific continues to pile up records each day it operates and it is already fulfilling its complete Destiny as the coast terminal third of a through Chicago-San Francisco transcontinental line.

The Denver Gateway, the Pueblo Gateway, the Salt Lake City Gateway all pour their Westbound traffic to the WP, and the tracks from Roper Yard, Salt Lake, to Oakland Terminals, Cal., hum night and day with an ever growing pressure of freight traffic. The Rio Grande, the Missouri Pacific, the Burlington and the Rock Island, four other huge Western systems likewise profit by the successful upbuilding of the once "little" Western Pacific, and in this Railroad Puzzle are the makings of a fine Postwar competitive situation that bodes fair to meet airplane and highway competition face to face and come up with a fat share of the business.

In its entire history perhaps the most outstanding achievement was constructing the $10,000,000 Mountain line from Keddie to Bieber. The nation had almost forgotten the Western Pacific when, suddenly it was greeted with the spectacle of the late and famed Arthur Curtiss James, publicity-shy, tall, bewhiskered, railroad tycoon who carried single handedly all the best Empire Builder traditions down from James J. Hill,—in shirtsleeves, pince-nez glasses and Fedora, driving the "last spike" at Bieber in 1931. In 1932 this line brought in $1,200,000 in freight revenue from 13,759 cars handled, and by 1942 this had risen to over 100,000 cars of freight, or an increase of nearly 700% in 10 years!

Almost unvaryingly the pattern for farsighted American railroads in the past 5 years has been to figure out three or four of the toughest spots on their entire Systems and gingerly (at first) buy two or three Diesel Freight locomotives and turn them loose on practically a 24 hour grind to either deliver the goods or wear out and fold up in the process.

Western Pacific has three stiff "hills" to climb—the 60 Mile Wendover Hill, where the line ascends about 1700 ft., with a couple of ups and downs besides; the Feather River Canyon, 100 miles in the Canyon proper of continuous 1% grade, with an additional 17 miles of .4% grade at the lower end; and the Bieber Line, which starts off abruptly at 3200 ft. and climbs in 53 miles to 5700 ft., ambles up and down through a magnificent mountain forest for the next 25 miles, then plunges for the next 34 miles down to the Pit River and Bieber—all but 23 miles of the



MAINTENANCE SCHEDULE — Form No. 1

Loco. No. _____ Month _____ 19__

INSPECTION DATES, OROVILLE

AFTER EVERY TRIP

- Change Air Filters
- Check Fuel Glasses
- Check Crab Nuts
- Check Fan Belts
- Check Blower Belts
- Check Aux. Gen. Belts
- Drain Air Reservoirs
- Check Control Air Pressure
- Inspect Running Gear
- Clean Eng. Rooms & Cabs
- Wash Exterior
- Check for Oil Leaks
- Test Air Equipment
- Check Supplies
- Check All Gages with Engr. Running
- Check Exh. Valve Blow-By
- Inspect Lash Adjusters
- Change Side Filters
- Test Engr. Fuel Valves
- Test Oil Viscosity
- Test Valves
- Clean Air Boxes
- Inspect Rings
- Inspect Brgs., Caps, & Bolts
- Inspect P-Pins, Baffle Plates
- Inspect Radiator Shutters
- Check Valve Adjustments
- Check Injector Racks
- Check Fuel Filters

ELECTRICAL MAINTENANCE SCHEDULE — Form No. 2

LOCO. Nº _____ MONTH _____ 19__

DATE

AFTER EVERY TRIP —

- READ BATTERY GRAVITY SET BATTERY CHARGE, CLEAN REGULATOR IF NECESSARY
- TIGHTEN ALL FUSES IN CLIPS
- RENEW ALL WORN TRACTION MOTOR BRUSHES ON ONE SECTION
- CLEAN HEADLIGHT AND ADJUST IF NECESSARY
- RENEW ALL DEFECTIVE CAB AND ENGINE ROOM LIGHTS
- CLEAN COMMUTATOR AND RENEW WORN BRUSHES MAIN GEN.
- RENEW WORN BRUSHES ON AUXILIARY GENERATOR
- WORK ALL GROUND RELAYS
- CLEAN ALL CONTACTORS AND RELAYS, TIGHTEN CONNECTIONS
- OPERATE ALARM SYSTEM MAKE NECESSARY CORRECTIONS
- TEST HIGH AND LOW VOLTAGE CIRCUITS FOR GROUNDS

ONCE EACH MONTH —

- MAKE SEQUENCE TEST
- BLOW OUT ALL TRACTION MOTORS
- BLOW OUT MAIN AND AUXILIARY GENERATORS
- TIGHTEN ALL LOOSE TERMINAL CONNECTIONS
- CLEAN LOAD REGULATORS
- WASH BATTERIES
- CLEAN FUEL PUMP MOTORS
- BLOW OUT AND CLEAN ALL ELECTRICAL CABINETS
- CLEAN AND LUBRICATE REVERSERS
- ADJUST BRUSH TENSION ON TRACTION MOTORS (MIN 7# MAX 10#)
- ADJUST BRUSH TENSION ON MAIN GEN. (MIN 5½# MAX 7½#)

LUBRICATION & MISC. SCHEDULE — Form No. 3

Loco. No. _____ Month _____ 19__

DATE

AFTER EVERY TRIP

- Fuel Water Tank
- Lubricate as Follows:-
- Eng. Oil Lub. Tank - Fill with URSA-40
- Journal Roller Bearings - RB-1558 Level to Overflow Plug
- Motor Support Bearings - Torsyce 748 Level Between 3½" & 5"
- Governor - SAE-10 Level at Sight Gauge Mark
- Air Comp. Crankcase - URSA-40
- Traction Motor Gears - Crater #2 or #5 to 3" Depth on Driver Gear
- Speed Recorder - SAE-10
- Water Pumps - Fill Oil Cup with URSA-40
- Fan Drive Clutch Collar - Starfax #2
- Governor Linkage - One Shot Starfax #2 from Hand Gun
- Fan Drive Crank Cases - URSA-40 Level at Fill Mark
- Speed Governor Brgs - RB-1559
- Diaphragm Centering Device - Starfax #2 at All Grease Fittings
- Drawbar Pins - Starfax #2 Sparingly from Pressure Gun
- Brake Adjuster - RB
- Center Casting - RB-1559
- Radiator Shutter Linkage - RB

ONCE EACH MONTH

- Lubricate as Follows:-
- Traction Motor Blower Brgs - One Shot Starfax #2 from Hand Gun
- Radiator Fan Bearings - Add Small Amount Starfax #2
- Dynamic Brake Grid Blower Brgs - Starfax #2

ENGINE LUBRICATION OIL — Form No. 4

Oroville _____ Month _____ 19__

LOCOMOTIVE UNIT	DATE	TOTAL
901		
901-A		
901-B		
901-C		
901 Mileage		
902		
902-A		
902-B		
902-C		
902 Mileage		
903		
903-A		
903-B		
903-C		
903 Mileage		
904		
904-A		
904-B		
904-C		
904 Mileage		
905		
905-A		
905-B		
905-C		
905 Mileage		
906		
906-A		
906-B		
906-C		
906 Mileage		

Form No. 1 is record of work done at roundhouse after every trip. Form No. 2 is the trip and monthly electric maintenance schedule for each of the four units comprising each locomotive.

Form No. 3 is the trip and monthly lubrication schedule for each unit. Form No. 4 is the composite lubrication chart for all road locomotives for each month.

line being practically one continuous Pusher District.

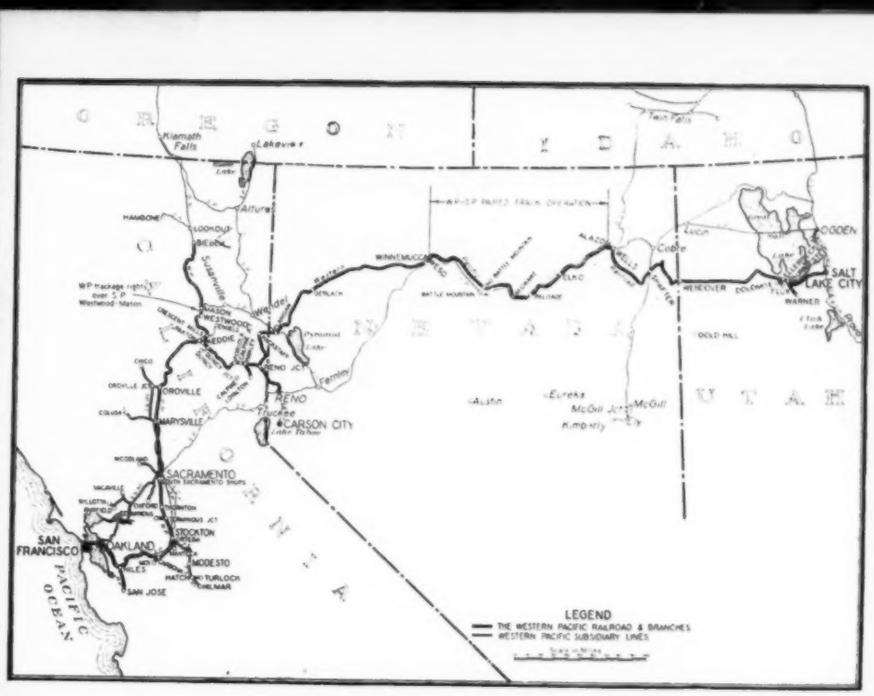
Having no coal mines to worry about, Western Pacific's choice of six versatile 5400 hp. EMC Diesel locomotives, starting off with 3 in 1942, 3 more in 1943 and six in 1944, has already proved not only astute from an operating standpoint, but a wonderful investment that has already begun to show returns on the books.

On the 1% grade in the Feather River Canyon, large 2-8-8-2 Mallet will haul 3400 tons up the canyon at 18-20 miles per hour. The 5400 hp. Diesel will handle 4000 tons at the same speed. However, these large Mallets are suitable only for use in mountain territory owing to their small drivers and speed limitation, whereas the Diesel can carry on in the flat country by utilizing its power in the form of speed.

Due to the scarcity of motive power, higher crews wages on mountain operation and the characteristics of the line, 4500 ton trains with 80 or 90 cars are made up at Bieber and three Mallet steam engines hooked on, two in front and one behind, to give an overall economic operation commensurate with conditions on this mountain route.

At first, with but three Diesels, Western Pacific used them to pinch hit everywhere on the line from Oroville to Bieber and Oroville to Salt Lake, and even used them as helpers and on passenger trains and troops trains, too. Soon, however, the marvelous operating qualities of these engines pointed to a through, fast operation on fast freight, leaving Oroville and running clear to Salt Lake and back, 1450 miles for the round trip, without a service stop the entire distance, except to refuel at Elko, Nevada. Up the steep Bieber line they lugged along with the Mallets, even though the Mallets run best at 12 miles per hour and the Diesels at 16. But wherever the bottleneck of motive power turned up, the Diesels ran swiftly to take over, until enough Diesel units were received to establish a through operation all the way across.

As with all mountain operation, getting heavy trains downhill is a costly and sometimes slow



Map of the Western Pacific. At Bieber, California, its Northern extension connects with the Great Northern to form the only north-south competitive railway network on the West Coast.

One of Western Pacific's E-MC Diesel locomotives emerging from lower end of Feather River Canyon with a 4000-ton freight train.

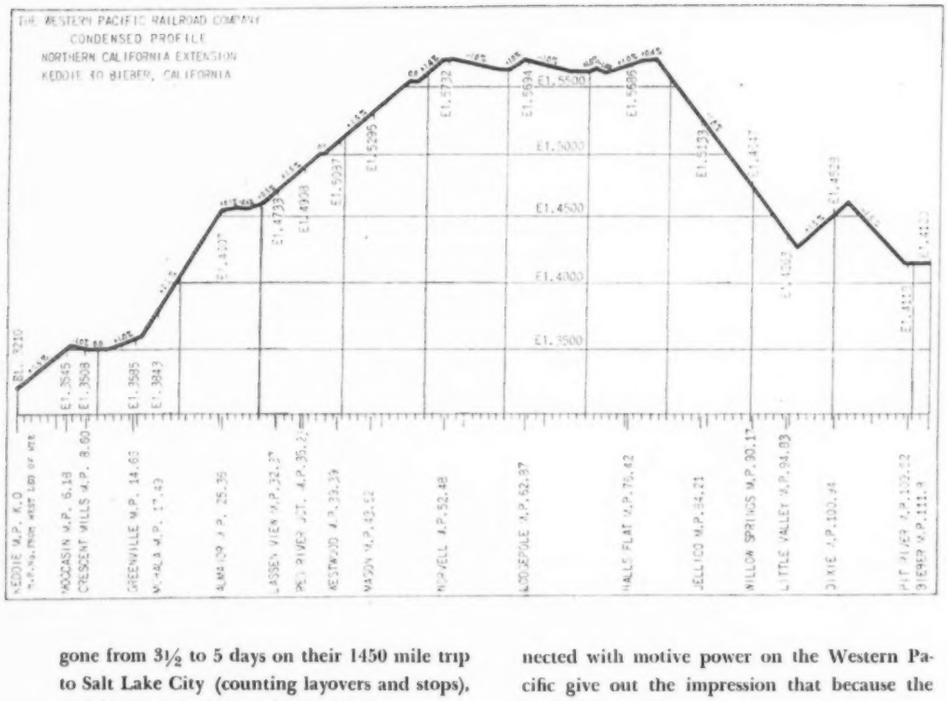
business. With steam operation, the Mallets drift for 117 miles downhill or pump air if they come down with a load of Westbound freight. The Diesels, No.'s 901, 902 and 903 have the old style 2-position dynamic brake and Nos. 904, 905 and 906 the new style of separately excited brake system which permits easing of heavy trains downhill for the 117 miles with hardly an application of air brakes!

Oroville, Cal., is the "home port" of the Western Pacific's Diesel freighters. Here at the bottom of the Feather River Canyon the big power of the line is stored, and the lighter power for use on the flat valley lines meets the mountain power. A big roundhouse cares for everything from the little Consolidations of Pre-World War I, to the biggest Diesel and Mallet in the fleet. Fourteen stalls for steam power and 4 new, longer stalls for the Diesels. E. T. Cuyler is the System Boss of Diesel Motive Power, working under Mr. W. J. O'Neill, Supt. of Motive Power for the company, with headquarters in Sacramento. Nursing along the fleet of Diesels and working out a Maintenance Routine and training help long used to steam power are the duties of Mr. Cuyler, and we'll go back to some of the interesting phases of his work after a ride out on one of the Diesels.

F. B. 122, Oroville to Salt Lake, consists of 55 loads and 19 empties—74 cars in all. Glory be but the Loads consist of 46 carloads of fresh green peas for Eastern markets, 5 cars of butter and oranges and 4 carloads of Wine in tankers! Food and drink for a king! We are scheduled to pull out directly behind the Exposition Flyer's last of 3 sections, and soon Engineer A. W. Fuller has the train rolling. It is a starlit midnight and 117 miles of continuous uphill pull are ahead. Past Bloomer the 1% grade begins and the train settles down to a steady 20 miles per hour pace. Sometimes when the curvature lessens, the speedometer reaches 24 miles per hour. For nearly 1½ hours absolutely nothing happens—not even a hot engine bell or a Problem! The train just keeps rolling along! Three times before we reach Keddie, in the chill mountain Dawn, stops are made to let Westbound trains pass, and each time the Diesel picks up the load with but little sanding of wheels, even though the train at practically all times is on from 2 to 6 curves and at no time do we ever see the Caboose until 6 hours later at Williams Loop, where the caboose is but a few feet ahead of us, like a cat chasing its tail! Busiest passenger is Thos. D. "Deacon" Hunter, Road Foreman of Engines, who has to teach Engineers and Firemen how to run Diesels—after they've spent a lifetime running steam.

Feather River Canyon has a total of 16,000 degrees of curvature and over 70 miles of the line is curved track. This means extra pull on uphill grinds for the longer freights, and all traffic is limited to 40 miles per hour up and downhill. In that 117 mile run to Portola, 19 separate "meets" were made, which meant either slow-slowdowns or almost dead stops, and included in this heavy Westbound movement were 5 sections of passenger trains—mostly Uncle Sam's troops headed for the South Pacific. Approximately 1600 gallons of fuel oil are used on a trip of this kind, compared with 6-7000 gallons of fuel oil for the Mallets—not to mention water and much wasted steam in pumping air for braking downhill.

From Portola, the long grind across the Desert begins. Hot scorching dust storms in summer. 45 below, sometimes, in Winter. And temperatures up to 117 degrees above in the Lower Feather River Canyon in Summer. The Diesels race across to Salt Lake City, and without necessity of turning, and sometimes less than 2 hours before starting back Westward, the Diesels are



gone from 3½ to 5 days on their 1450 mile trip to Salt Lake City (counting layovers and stops), and in a pinch they make a trip back up the Canyon to Portola and down to Oroville, without once shutting down the Diesels! By the end of 1944, twelve of these 5400 hp. EMC Diesel freight locomotives will be on the run.

Western Pacific now has a fleet of 19 Diesel switchers, eleven of the 600 hp. size and eight of the 1,000 hp. size; seven, 4-6-6-4 simple Mallets in use on the Wendover Hill section; ten large oil burning 2-8-8-2 Mallets for use in the Feather River Canyon, and a fleet of ten 2-6-6-2 compound Mallets of the old fashioned kind, so to speak, now used exclusively on the Keddie-Bieber line. Biggest of the steam fleet is the 2-8-8-2 Mallet type, with 150,000 lbs. tractive effort, which compares next down the line to the 225,000 lbs. tractive effort at starting, of the Diesels (with 62:15 gear ratio).

It is interesting to observe that prior to the War, Western Pacific used approximately 17 Mallets. Even a slant-eyed glance at the comparative operating costs per mile and the availability record set up by both steam and Diesel, the fleet of 12 Diesels could provide two daily freight round trips to Salt Lake and one daily round trip to Bieber, and do away with Mallet operation entirely!

So the postwar motive problem *can be* considered well on the way toward solution by the setting up of a high-pressure Wartime Diesel operation, getting crews trained and maintenance routines established, now, while the money is rolling in.

Practically all of the various personnel connected with motive power on the Western Pacific give out the impression that because the Keddie-Bieber line is new, has plenty of water facilities installed and plenty of pure mountain water, it will be logical to put the big 2-8-8-2 Mallets on this run and convert the entire system from Oroville to Salt Lake to Diesel operation, including passenger trains. All of which seems logical in view of the conditions that have developed on the Western Pacific.

On the other hand, we encountered a bright young fellow in Oroville roundhouse who gleamingly told us of his interest in Diesels and railroads, and who made the flat prediction that the "Figures kept by Mr. Cuyler conclusively proved that the company will junk all its steam power on mountain runs and use Diesel exclusively within the next 5 years" . . . !! And this young fellow appeared to be about age 30—just right to go railroading from the mechanical end!

Working between the pressure of War traffic, local manpower shortages and the whole job of breaking in a new piece of equipment with green help, is the job of Mr. Cuyler. His enthusiasm for Diesel is boundless, and his knowledge of tricks and shortcuts is equally boundless. Western Pacific has deliberately set up a 90% availability schedule for all Diesel locomotives, with definite tonnage limits (most railroads don't),—to maintain a definite fixed speed. In other words every Diesel powered freight train going up Feather River Canyon must run between 20-25 miles per hour, no more nor less. Which facilitates dispatching and keeps meets and passing delays at a minimum. Formal, somewhat clumsy operating manuals have been discarded; forms simplified and reduced to four types of Maintenance and Service Reports. No "Rider" goes with the Diesels—the Firemen take temperature and gauge readings enroute and record them for guidance of the shop forces. Oil changes are now at 30,000 mile intervals, using Texaco x 2 Star SAE 40 Lube oil, and experiments are underway to increase this to 40,000 or 50,000 miles before a complete change.

When the Diesels come into Oroville, after their 1450-1700 mile round trips, they are split into two sections of 2 units each, thus they fit the regular turntables, regular size stalls and can be conveniently backed into the stalls, leaving the central opening accessible to a wide portable stairs, for easy access and cleaning.

The pits below, plus ample width in the aisles, permit lube changes, repairs, cleaning, inspection of traction motors, tanks, brakes and trucks and wheels, simultaneously, without everybody getting in the way of everybody else. The amazingly compact service organization at Oroville, exclusively devoted to handling the Diesels, consists of a lead man and helper, 1 foreman, 1 electrician and 1 helper.

Diesels Nos. 901, 902, 903 in 2½ years have had only 2 pistons and 3 liners changed for all three locomotives, and each has averaged between 230,000 and 250,000 miles! Two traction motors have been changed and most of the original wheels are still in use! No. 904, for instance, the day we visited Oroville Shops had not had a maintenance inspection for 2640 miles—too busy to stop for a check-up!

And so it goes . . . Western Pacific is squeezing the very utmost out of its Diesels, and the operating statistics show what can be done by a small, compact organization, a sound operating schedule and a careful pruning away of unnecessary flapdoodle and traditional Roundhouse Red Tape carried over from steam locomotive operation practices. Treat Diesels like trucks, and give em plenty of oil and keep the bolts and nuts tight and they'll run forever, is the growing motto of wise Diesel operators!

Western Pacific hasn't time to baby its motive power now, so, unwittingly, it has begun to teach other U. S. railroads a thing or two about simplified Diesel operating practices, and some of the steam-fetish railroads who persist in their belief that Diesels cost more than steam, and to prove their point, load up their Diesel maintenance payroll with excess hired help, should

take a good look-see at what Western Pacific is doing right now. Intelligent pioneering plus simplified Horse Sense is the best way to describe their methods.

Space does not permit extensive reproduction of the operating statistics of Western Pacific Diesel and Mallet steam locomotives. However we are indebted to Mr. E. W. Englebright, Assistant to Mr. Charles Elsey, President of the Company, for some mighty interesting operating notes.

The 5400 hp. Diesels, for example, turn up for the full year of 1943, the 6 Diesels rolled up a total of 418,949 miles. They hauled an average of 3,331 gross tons per train-trip, and rolled up an average of 89.64% availability, possibly the highest average of any Western Railroad operating Diesels. They used 2,605,099 gallons of Diesel oil and 37,651 gallons of lube oil, in case you're interested.

Getting down to the locomotive mile cost, Western Pacific, for the year 1943, turned up with 83.97 cents per locomotive mile, and remember this figure is arrived at with the locomotive hauling an average train of 3,331 gross tons.

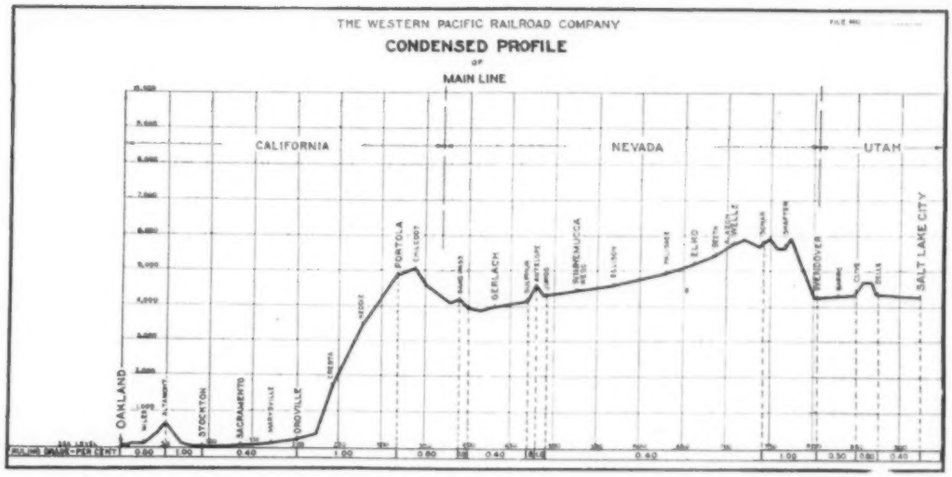
To put it into high school language, their 1,000 gross ton mile cost was but 25.99 cents. Or in 6th Grade English, Western Pacific hauled 1000 tons, one mile for two bits!

It seems to us the Maritime Commission recently reported it cost more than this to haul the same tonnage in a Liberty ship one mile.

Two other interesting little statistics show the Western Pacific burned 124.97 gallons of fuel oil per locomotive service hour, and 1.81 gallons of lube oil per Ditto Hour. And they averaged 19.49 miles per hour with this 3,331 ton freight train over grades and plains.

Now let's compare it with Western Pacific's fine fleet of steam Mallets: The company breaks their major Comparative Cost Statement into two sections, the big 2-8-8-2 Mallets that develop 150,000 lbs. total tractive effort, and run in the Feather River Canyon; and secondly, the 100,000 lb. tractive effort Mallets that run over Wendover Hill. Ten of the former and seven of the latter comprise the latest, most efficient freight steam power on the W.P.

NOTE: In fairness it must be emphasized that the steam engines operate in the Hill areas exclusively. But, of course, they drift downhill light, for part of the time.



I. *2-8-8-2's*

Total Mileage for all ten, for 1943: 385,200.
(Compared with 418,949 for only 6 Diesels)
Gross tons per train: 2,618
(Compared with 3,331 for Diesel)
Percent availability: 53.66
(Compared with Diesel 89.64%)
Cost per locomotive mile: $1.7340
(Compared with 83.47 cents for Diesel with 50% greater load)
Cost per 1,000 gross ton miles: 75.68 cents
(Compared with 25.99 cents for Diesel)
Average speed: 12.83 miles per hour
(Compared with 19.49 miles per hour with Diesel)

II. *4-6-6-4's*

Total Mileage for all seven locomotives for 1943: 332,611
Gross tons per train: 2,561
Percent availability: 52.33%
Cost per locomotive mile: $1.6519
Cost per 1,000 gross ton miles: 70 cents
Average speed: 18.11 MPH.

There you have a mighty interesting and accurate picture of a typical Locomotive operation with steam and Diesel used where they fit best. . . . The light steam Mallets used over on Wendover Hill, show 50% faster average speed than the Canyon Mallets—almost as fast as the Diesels.

But in spite of their 100,000 lb. tractive effort as compared with the 150,000 lb. engines used in the Canyon, they turned up with only about 5 cents less per mile cost. In neither instance is the downhill ease of train operation, absence of wear on brake shoes with regenerative brake on the Diesels, the equation of capital outlay, etc. taken into the total picture. Nor is the costly water facilities arrangement needed to keep steam engines running set up as a capital cost to offset the higher cost of Diesel locomotives, but lower initial cost of steam. And so the battle goes.

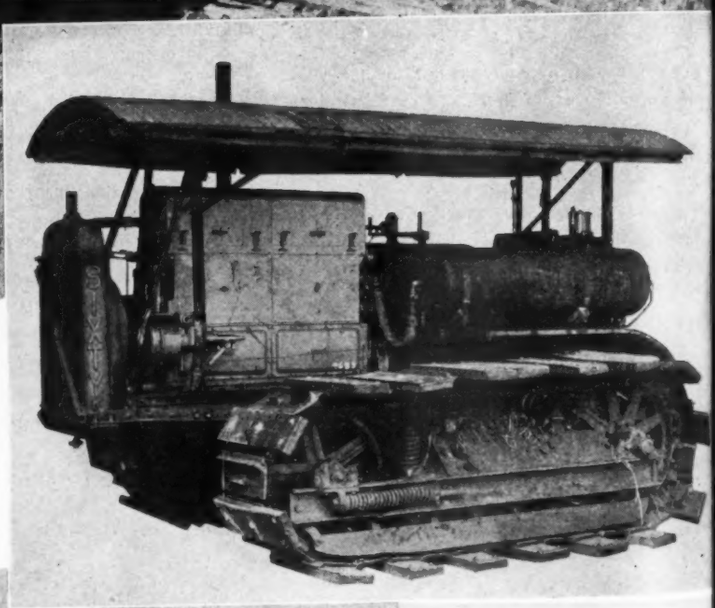
Results in Railroad ton miles hauled are all that count.

Western Pacific has a magnificent Laboratory to test motive power, and its key position in the Traffic Picture cannot help but keep this fine little System on top of the pile in the operating picture. And it will be even more favorable when they get a full dozen Diesels at work in their power pool.

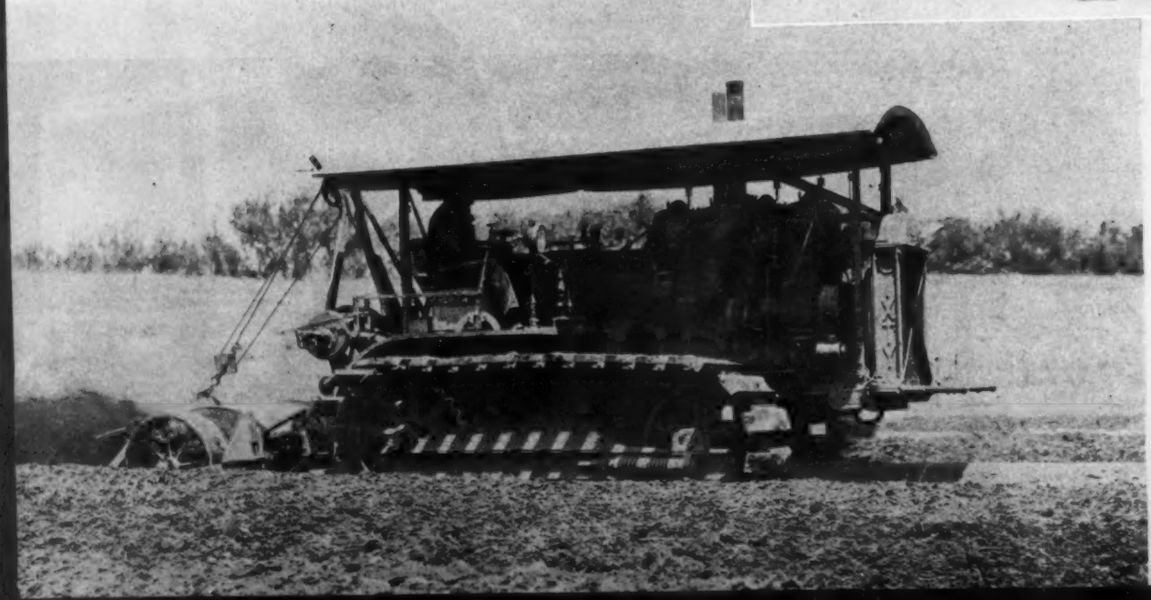
And, in the Postwar era when you glide down Feather River Canyon by daylight once more, you'll probably be riding behind or seeing Diesels most of the way through this lowest Pass across the Sierras, the route the Pioneers chose to open the Salt Lake City Gateway.

R. T. Ronan, extreme left, general roundhouse foreman at Oroville and his crew, (50% women), who maintain and service all of the road's Diesel locomotives.

An early Atlas Diesel change-over tractor "cow-dozing" in Kaiser's gravel pit in 1937.



Close up of the Atlas 80 hp. Diesel installed in a Caterpillar "Sixty" Chassis—a daddy of the modern Diesel tractor.



A Chinese farmer's Atlas Diesel tractor at work in asparagus beds in the San Joaquin delta

Seen again in Kaiser's gravel pit, this Atlas Diesel tractor had previously worked on Mississippi levees for Kaiser.

FELLER NAMED KAISER PRODDED THE DIESEL INTO THE TRACTOR!

By F. HAL HIGGINS

"WHEN the Diesel tractor is ready, Caterpillar will have it!"

Such was the declaration of C. L. Best to western Caterpillar dealers meeting at the Hotel Oakland, back in the fall of 1927. The answer of the Board Chairman of that company on that day to the unasked question about Diesel engines in tractors was not so much a challenge to the dealers gathered there as it was to the insistent proddings of another bald man who was beginning to be heard of as a dirt-moving contractor who always wanted something better to help him cut costs on a dirt-moving job. The persistant dirt moving contractor went by the name of Henry Kaiser. He was just another dirt mover in those days and he frequently got out beyond his depth or bit off more than he could chew and took a beating on a job, even as did other bidders on Mississippi river levees, or on highway stretches with mountains or swamps that concealed trouble not caught by the casual eye of a bidder.

It was not surprising that the efficiency of Diesels should come to the attention of this hustling go-getter contractor. Immediately he found that Diesels cut costs in half wherever they appeared in action on dirt moving jobs that could use draglines, power shovels, pumping installations, etc., he wanted to know why in the name of high, low, Jack and the game, crawler tractors couldn't be Dieselized to give that piece of important equipment a big boost in efficiency while cutting costs. When puzzled salesmen and dealers would patiently explain to the Quiz Kid of the dirt movers that there was no such animal as a Diesel tractor, he just kept asking, "Why not?" Also, he hinted so broadly that the hints began to trickle back to the engineers and officials of the concerns whose products were being questioned as to their possible obsolescence.

Naturally, Mr. Kaiser forced the issue until he got some firm started to building him his Diesel tractor. The Atlas Diesel was the power that was lifted out of its stationary job of pumping, marine service, etc., and installed into the chasses of such standard crawlers as the Cat Sixty and the Monarch 75. Check-ups at Atlas and delving into the old files show that firm worked with the future ship building wizard back in 1926 to '27, changing over several of his standard Monarch tractors then being manufactured by Allis Chalmers Mfg. Co. at the old Watertown, Wis., plant of the Monarch Company, which was taken over by Allis-Chalmers soon after Monarch failed to survive the end of World War I. In that war Monarch had built war tractors under Holt and other licenses.

Not only did Atlas work with Kaiser to Dieselize his standard gasoline tractors of these two makes, but the manufacturer also turned out several tractors for ranch work in California, Oregon and Hawaii. It was the writer's pleasure and surprise to find that 90% of these Atlas Diesel change-overs were still in action in 1937.

Down on the Tulare lake bed west of Corcoran was one that had 28,000 hours on its work log at that time, according to the owner and his son. They had run it night and day for months without stopping while pumping for irrigation after being lifted out of the old Cat chassis where it had done all the heavy ranch work since starting in 1932. Another one was seen at this time doing this same heavy ranch work and it went on for another six months before being overhauled for the first time at the end of over 30,000 hours work.

These Atlas Diesels were 80 hp., and when set into the crawler tractor chasses were much too heavy for the frames and looked clumsy by today's standards. Yet they did herculean work and put to shame many of the early Diesel tractors when it came to running along for months and years without trouble and service.

Atlas really had something that should have been pursued in this field at that time. But a reorganization with new faces in the Atlas management turned the company to the marine field and Allis-Chalmers engineers turned to the Swedish semi-Diesel of Europe until the trend forced them to turn back to the American product and the GMC line of Diesels that have proved so successful for that company today.

Shown here are several views of one old Kaiser Diesel tractor taken at his gravel plant in the Livermore Valley. With this "cow dozer" for pulling down gravel piles, it was quite an active piece of equipment the last time your Old Reporter went in to see it. Anyway, that name Kaiser deserves a salute for something before he showed the world how to build ships. Kaiser really prodded the tractor builders into action.

SUPERVISING & OPERATING ENGINEERS' SECTION

DIESELS AND THE POSTWAR PERIOD

Conducted by R. L. GREGORY*

WAR leaves its mark, not only upon the youth and fighting forces of those Nations involved, not only on the economic structure of those involved but also on that equipment which has been pushed to unbelievable limits to secure all out production. Utility and power plant equipment has not been exempted from the ravishing wear and tear of unprecedented demands upon it, and the question which now arises to confront us is "How and when can we expect relief in the way of new and more modern equipment"?

From all indications there is a bright future in store for those engaged in the manufacture of Diesel engines and all auxiliary equipment involved. As in the case of all great emergencies, this war has taught us many lessons. We have found out, that where there is a will to overcome the apparently impossible, there is always a way. Manufacturers of all types of mechanical equipment have been confronted with problems of design, problems of substitution of materials, and problems arising from unheard of operating conditions, the likes of which had never been anticipated. The Diesel manufacturers are no exception.

Diesel power is economic power and is becoming more so each year as new developments in design are accomplished. The demand for Diesel units from the smallest to the greatest sizes has been increased many fold during the past decade. This has been due to several causes, chief among which have been, new applications of such power to motive uses, more horsepower at less weight in the unit, which in turn requires less space for installation, the fact that a Diesel unit is a compact power producer in itself, little space being required for auxiliaries, and last but not least, the availability of fuel to develop such power.

While the Diesel engine is far from what one would call a perfected unit in the sense of a minimum of maintenance and mechanical attention, still we cannot but admit that great strides have been made toward that end in the last decade, and especially during the last four years. Many of the moving parts formerly used in the integral mechanism of the units have been eliminated. Others have been improved upon to such an extent that their longevity is greater. As an example of this we can take the proposition of cylinder liners.

The wear upon the liner walls has always been more or less of a problem in larger units, not so much in the smaller ones. Economic operation required the renewal of these liners every few years, or if one did not do this, he was forced to use oversized rings or renew his rings much oftener than when his liner wear was at a minimum. Through research and investigation many manufacturers have found that by different processes of heat treatment, on different grades of metal, they could produce a liner with a great deal more resistance to wear. This research in many cases was forced upon them by operating methods.

Units put into service had to function day and night and outages were a thing out of the question. There was a definite *must* to their operation. As a consequence they could not be shut down for changes due to wear and tear if such conditions could be avoided. One plant which the writer has in mind, found that after four years of operation, there was a definite decrease in unit efficiency due to liner wear. Rings had to be replaced more often and still the efficiency did not hold up as it did in the first couple of years of operation. Therefore it was decided to install new liners. When these liners arrived it was noted that the texture of the metal was decidedly different from the old liners. They were installed and after several hundred hours of operation, a couple of pistons were removed and the wear checked up, and found to be negligible. When this condition was reported to the manufacturer, the customer found out that his new liners were of a different composition and especially heat treated to resist wear.

The same condition holds true on piston rings. Many makes, designs and materials have been tried out with varying results. They have been tried with various lubricants under varying operating conditions, and the results have been most satisfactory. This is just one example of improvements which have been made by the necessity of war production, and there are dozens of similar ones in all lines of mechanical equipment.

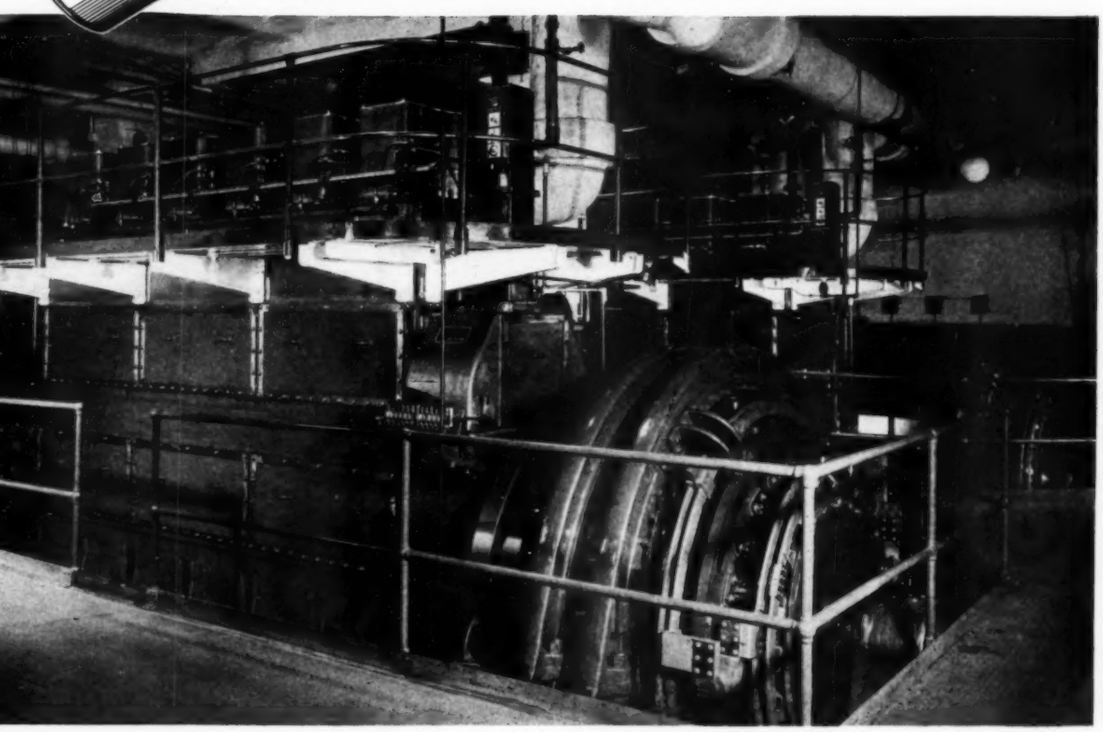
While many people are pessimistic over post-war conditions, there are those who feel that there is no cause for such pessimism. A survey made among the industrial plants in one large area of our country, showed that due to depreciation, of all types of mechanical equipment, it would require approximately eight per cent more power output from the utilities and power plants, three years after the war ended, than the peak output of the same plants during our best efforts in 1944. The cause for this increase being, that much more available power would be necessary in order that the industries in that particular area might meet the demands for post-war production which would be forced upon them.

Civilian needs for equipment, needs for industrial use and farm equipment showed that the production for replacement of equipment worn out and unobtainable during the last few years would call for heavier production schedules. This in turn would mean a greater demand for power. But since power plants have also been unable to obtain needed repairs and new equipment, a period of from two or three years would be required to re-equip and recondition these plants before they could meet such a power demand.

This is where the Diesel manufacturer comes in. He has been improving his product, has been under full production of Diesel units for ships, and other war industries and as soon as the demands for war can be relieved, he can divert his energies to the production of units for the various power plant needs. In one state alone in the midwest, there are eighteen plants contemplating the installation of additional Diesel units either as replacement of smaller units or as additional generating equipment. These units will be of the latest design with all the modern improvements, and will for the most part be of the larger sizes. Some of these units may rate as high as 6000 bhp. and will be equipped with the latest types of hydraulic valves, fuel and lubricating systems.

* *Chief Engineer, Municipal Water and Light Plant, Hillsdale, Michigan.*

Better LUBRICATION MEANS *Better Maintenance*



• Excessive wear and difficult maintenance often result from inadequate lubrication.

Sinclair provides Rubilene and Gascon Oils for *better lubrication* of *DIESEL ENGINES.* They are non-corrosive, sludge-resistant, and assure complete power seal . . . maintain safe lubricating film under continuous heavy duty operation.

• • •

(Write for "The Service Factor" — published periodically and devoted to the solution of lubricating problems.)

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Exchange Your Diesel Maintenance Ideas

"Emergency Maintenance without Service Interruption"

Conducted by R. L. GREGORY

Editor's Note: In this department we provide a meeting place where Diesel and Gas engine operators may exchange mutually helpful maintenance experiences to keep our engines in top condition. Mr. Gregory edits your material and adds constructive suggestions from his own wide experience. This is your department—mail your contributions direct to DIESEL PROGRESS.

ENGINEERS and operators are frequently confronted with problems which require immediate attention. Usually these problems spring from a clear sky and at the most inopportune moments. The following is an illustration of such an incident which recently happened in a midwest plant.

The plant in question has five generating units, two of which are rated at 1500 kw., one 750 kw. unit, one 650 kw. unit and the other a small 300 kw. unit. Peak demand on this plant during the early summer months usually runs from 3000 to 3250 kw., while the average hourly load from 6 o'clock in the morning until near midnight is around 2600 to 2900 kw. The peak periods occur an hour before noon and just at dusk on the evening load. From midnight until 6:00 A.M. the load varies from 1400 to 1800 kw.

From the hours of 6:00 A.M. until midnight, normal operation consists of running the two 1500 units, augmented by one of the smaller ones. Since the peak loads during the rest of the year run from 3400 kw. to 4000 kw., one can readily realize that the proper period for annual inspection and overhaul should be during the low peak months of early summer.

At the same time from the above explanation you can readily see that if one of the fifteen hundred kw. units is out of service. all other available units must be in operation to carry the noon peak of normally 3250 kw. or even to operate the hourly demand of 2900 kw. during the eighteen hours from 6:00 A.M. until midnight.

A few weeks ago it was decided to remove one of the 1500 kw. units from service for the annual inspection and this was done. For several days all went well, when it was noticed that the other fifteen hundred unit was showing distress due to overheating of the oil on three cylinders. Under load conditions it would be impossible to remove this unit without causing a service interruption, which is the last thing any power plant wants to have happen if it can be avoided.

A compression card was taken off the unit showing distress and it was found that the compression on three cylinders was considerably below normal operating compression, and in varying degrees of loss. This showed that these three cylinders were in various stages of blowby as far as the rings were concerned. So the following course was adopted in order that there would be no service interruption. The unit was shut down on three successive nights, after midnight, allowing the three small units to carry the load which amounted to operating at rating or just a little over.

Each night a piston was pulled and cleaned and new rings installed. This operation took about three hours, that is dismantling, reringing the piston removed, and reassembly. The unit was then back in operation around 4:00 A.M. and ready for the next day's service. At the end of the third night the unit was recarded and all cylinders operating under normal compression conditions and the oil temperatures back to normal. Also there had been no interruption to service.

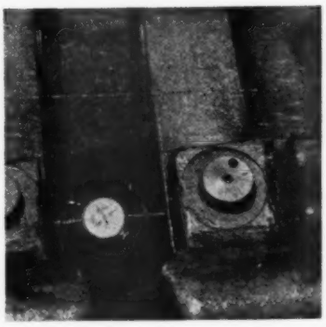
One way in which such maintenance could have been accomplished with a shorter outage of time, would have been to have an extra piston on hand, cleaned and equipped with a new set of rings. The time in making the change would have been shortened considerably, had they been able to pull the piston with the defective rings and immediately replaced it with a spare. Then the piston which was removed could have been cleaned the following day by the maintenance crew and new rings installed, thus making it ready for change the next evening.

We might carry this even further to other parts, such as compressor valves, bearings, etc. Spare parts are good insurance and the outage of any unit, when sorely needed can be lessened, by carrying a sufficient stock of these spares.

There are always periods during the week when maintenance crews have odd moments which can be devoted to keeping the spare parts in first class condition. In our own plant, we have a batch filter, to reclaim our spare supply of lubricants. During the period of heating a batch, the maintenance man in charge, laps in valves, cleans up spare parts, and keeps the stock of ordinary spares in first class shape, so that in case we have an emergency repair to make, the maintenance crews do not have to stop and clean parts, lap in valves or do any work which will require a longer period of outage than is absolutely necessary.

Another advantage of this system is that time wasted while waiting for the batch of oil to heat up before being passed through the filter, can be profitably used along other lines of maintenance work. His bench is near the filter so that he can keep an eye on his filter while also doing other maintenance work. Thus the cost of filtering is cut down, by the time devoted to other necessary maintenance work, and we are killing two birds with one stone.

Proper Setting of a Deflection Gage in Checking Misalignment



IN a recent issue of DIESEL PROGRESS, we promised to give an illustration showing how the deflection gage should be set between the crank webs in checking for web strain and misalignment. The accompanying photograph shows how this instrument is used. Note that the gage is set parallel to the shaft and well out toward the end of the webs and that it is centrally located so that any closing or opening of the web as the readings are taken in the four quarter positions will be registered either as plus or minus from the zero point. This gage can also be used in measuring movement of engine frame castings, foundations and other similar parts as well as checking web strain and misalignment.

MARQUETTE HYDRAULIC GOVERNORS AND OVER-SPEED TRIPS

DIESEL POWERED D.P.C. TUG
EQUIPPED WITH MARQUETTE HYDRAULIC GOVERNORS
AND OVER-SPEED TRIPS

BUY MORE WAR BONDS

ARMY NAVY E FOR EXCELLENCE

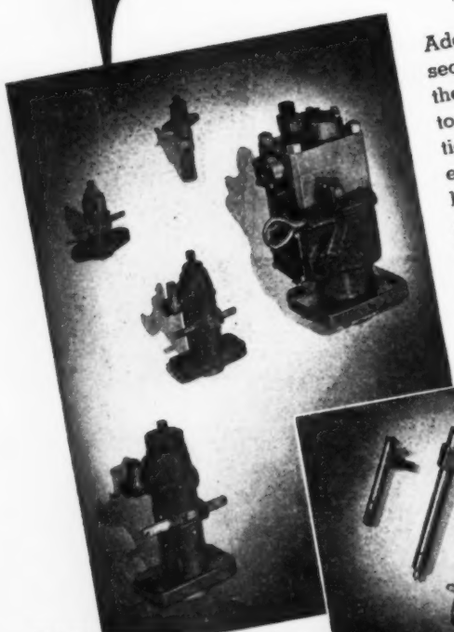
The Marquette METAL PRODUCTS CO.

CLEVELAND 10, OHIO

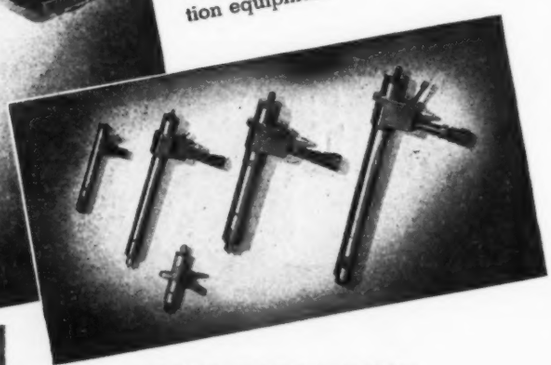
Manufacturers of: HYDRAULIC AND ELECTRIC WINDSHIELD WIPERS FOR AIRCRAFT
HYDRAULIC GOVERNORS FOR DIESEL ENGINES • ROLLER BEARING TEXTILE SPINDLES • FUEL OIL PUMPS
AIR COMPRESSORS • PRECISION PARTS AND ASSEMBLIES

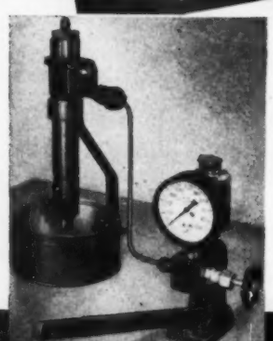
ADECO

SAFEGUARD DIESEL ENGINE PERFORMANCE
with Dependable ADECO
FUEL INJECTION EQUIPMENT



Adeco equipment is engineered to secure the optimum performance of the engine you are building or plan to build. Today's line of fuel injection pumps, nozzles and nozzle holders is the most dependable in Adeco history—the result of years of pioneering and research for the diesel industry. Their performance speaks louder than words in pointing the way to the finest in diesel fuel injection equipment.





ADECO NOZZLE TESTER
for LOW-COST MAINTENANCE

America s most widely used Nozzle Tester enables any mechanic to make quick, accurate tests on injector opening pressure, spray pattern, etc., and detect stuck needle valves and leakage around valve seats. Compact, portable, sturdy, precision-built. Pressures up to 10,000 p.s.i. Tests both large and small injectors. Avoids costly delays and possible damage to engine. Also obtainable with Navy-approved gauge. Write for bulletin.

Ideal for Testing Hydraulic Equipment

AIRCRAFT & DIESEL EQUIPMENT CORPORATION
4401 RAVENSWOOD AVENUE, CHICAGO 40, ILLINOIS

Continental Buys Gray

CONTINENTAL Motors Corporation has purchased the stock of the Gray Marine Motor Company in Detroit. There will be no change in the management or in the policies of the Gray Marine Motor Company. It will continue to function as an independent unit rendering service and doing business, just as it has done in the past. Mr. Frank O. Fernstrum is Executive Vice-President and General Manager of the company. He, along with Mr. J. B. Moran, Mr. Grant H. Nablo and Mr. John W. Mulford, will continue to direct the policies of the company in the future, as they have in the past.

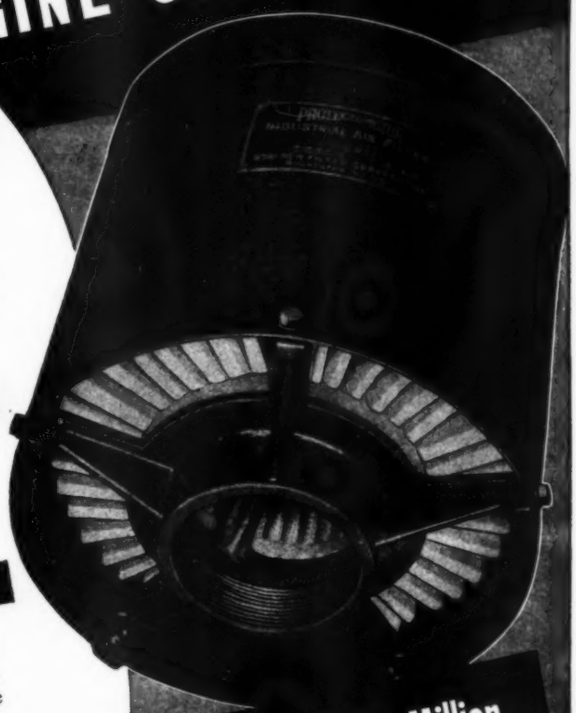
K. R. Van Tassel Named Manager of GE Industrial Control Division

K. R. VAN TASSEL was recently named manager of the Industrial Control Division of General Electric's Industrial Divisions, it has been announced by J. E. N. Hume, commercial vice president. Mr. Van Tassel succeeds George R. Prout, recently appointed manager of the Company's Air Conditioning and Refrigeration Division of the Appliance and Merchandise Department.

K. R. Van Tassel

Mr. Van Tassel, a native of Geneva, N. Y. attended Hobart College and was graduated from the Massachusetts Institute of Technology in 1925. He joined the General Electric Company as a student engineer the same year. In 1926, he was transferred to the Transformer Engineering Department, Pittsfield, Mass. where he remained until 1928 when he entered the Single-phase Motor Department there. Later he was made designing engineer of that department.

WHY PROTECTOMOTOR AIR FILTERS ARE BEST FOR DIESEL ENGINE USE ★ ★ ★



★ HIGH EFFICIENCY WHEN INSTALLED

Protectomotor Air Filters for internal combustion engines and compressors feature dry-type filtering media. These media are selected to fit particular installation conditions. They have been scientifically tested in the laboratory and proven by field use. Used in combination with the patented Radial Fin Insert Construction, they provide highest operating efficiency.

★ INCREASED EFFICIENCY WITH USE

Protectomotor filtering efficiency actually *increases* when dust begins to accumulate on the surface of the media, since this forms a pre-coating or filter-aid of the very material which is being handled.

★ LOW RESTRICTION TO AIR FLOW

Protectomotors at maximum ratings offer initial resistance to air flow of less than ½" of water. Since the exclusive Radial Fin Construction provides a maximum of filtering area, this resistance is held to a minimum throughout the life of the filter.

★ SERVICING SELDOM NECESSARY

The Protectomotor is a masterpiece of simple, rugged construction. There are no moving parts, no reservoirs, no liquids. The extremely large active filtering area reduces cleaning to an absolute minimum for any given set of conditions. When required, cleaning is quickly and easily accomplished by vacuum, compressed air, or washing.

★ POSITIVE PROTECTION ★ ★ ★ ★

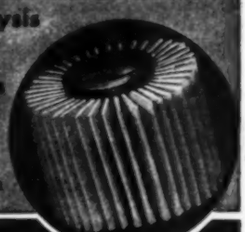
Inherent characteristics of the dry-type filtering media provide *positive* protection. Performance is *not* dependent upon periodic renewal of viscous coatings or other filter aids. Ideal for dust storm areas.

★ EFFICIENT AT HIGH OR LOW TEMPERATURES

As the filtering media used are of the dry-type, peak efficiency is maintained under all atmospheric conditions. There is no oil to evaporate at high temperatures or to congeal at low temperatures.

More than Half a Million Installations on Internal Combustion Engines and Compressors since 1920

Write for Catalog and Data Blank for Free Analysis of your Requirements



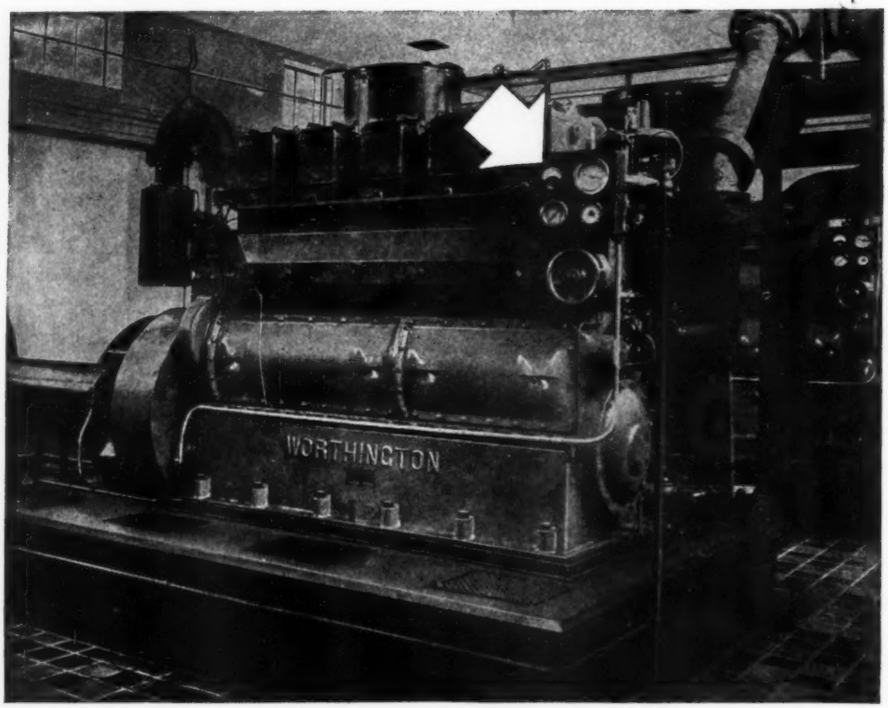
Radial Fin Construction

STAYNEW PROTECTOMOTOR FILTERS

DOLLINGER CORPORATION

(Formerly Staynew Filter Corp.)

12 Centre Pk., Rochester 4, N. Y.



Alnor Pyrometers

The dependable guide to dependable engine performance

These Worthington 175 hp gas engines operate on sludge gas and drive centrifugal pumps in a mid-western sewage treatment plant. As in so many other installations of Diesel and gas engines where dependable service is paramount, you will find Alnor Exhaust Pyrometers on the instrument board. These reliable instruments provide for quick, accurate routine check of exhaust temperatures as a guide to operation, maintenance, and adjustment.

Alnor Pyrometers are built in a complete range of types and sizes, single and multi-point, to meet the needs of installation with any type of engine. Write for special exhaust pyrometer bulletin with complete descriptions.

ILLINOIS TESTING LABORATORIES, INC.

420 North La Salle Street

Chicago 10, Illinois

In 1932, he was transferred to the Fractional horsepower Motor Engineering Department, Fort Wayne, Ind., in 1936 becoming its commercial engineer and in 1938 staff assistant to the manager of the Fort Wayne Works. In June, 1940, Mr. Van Tassel was made manager of sales of Lynn Motors, at General Electric's Lynn Works, where he remained until October, 1942, when he was named manager of sales of the Integral-horsepower Motor Section of the Motor Division, with headquarters at Schenectady.

New Bulletin on Isochronous Governors

MASSEY Machine Company has announced release of its Bulletin H-344 covering the Type H-3 hydraulic isochronous governor designed for accurate regulation of Diesel, gas and steam engines and turbines. This bulletin contains definitions of governor terms, enumerates Type H-3 governor applications, describes the operation of this governor in detail using a cross-section line drawing with parts identified numerically and gives complete engineering data outlining information required for proper handling of inquiries. Various other types of Massey governors are briefly described. A copy of Catalog No. H-344 will be mailed on request to Massey Machine Company, 783 Pearl Street, Watertown, New York.

Petroleum Solvents Announces New Personnel

PETROLEUM Solvents Corp. has announced two new additions to its sales department. Mr. A. T. Hudson will work under Stafford Jones, Southwest District Manager, and Mr. G. F. Boslar, who will join the San Francisco, Cal., sales office, working under Mr. Irving Tick, West Coast District Manager. Major Sid Harris has returned on furlough from his duties as Air Corps officer in charge of air fuels and lubricants for Brazil.

Hilco Duplex Lube Filters of C1-M-AV1 Vessels

HILCO Hyflow Duplex Lube Oil Filters were selected for 100 United States Maritime Commission vessels, design C1-M-AV1. These installations represent unique arrangement for filtering lubricating oil from the 1750 h.p. Nordberg and Busch-Sulzer Bros. Diesel engines. The filters operate entirely independent of the engine lube oil system. A separate pump is installed for withdrawing oil from lube oil tanks and forcing through the Hilco Filters and back to the tank. The duplex feature makes it possible to service the filters without interrupting the process of filtering the oil.

Have you a REMOTE CONTROL problem?

SPERRY'S EXACTOR HYDRAULIC CONTROL MAY SOLVE IT

Sperry's EXACTOR HYDRAULIC CONTROL, by means of a flexible, unique, single-tube system, has solved hundreds of remote control problems for design engineers in many industries.

Accurate and self-contained, requiring no special engineering to install or maintain, the EXACTOR HYDRAULIC CONTROL is well worth investigating.

Installation is simple and quick, because the EXACTOR uses tubing that can be bent *around* obstacles — thus eliminating all design problems. If *you* have a control problem involving the accurate transmission of applied motion over distances up to 200 feet, send for our completely descriptive booklet.

Sperry's EXACTOR HYDRAULIC CONTROL is rated at 400 inch-pounds on the pressure stroke and 100 inch-pounds on the spring-return stroke.

HOBOKEN NEW JERSEY

FILL OUT AND MAIL COUPON BELOW • NO OBLIGATION

SPERRY PRODUCTS, INC.
HOBOKEN • NEW JERSEY

D.P. EHC-944

Gentlemen: Please send me, at no cost, a copy of your Bulletin 78-D containing complete details on your EXACTOR HYDRAULIC CONTROL.

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____ CITY _____ STATE _____

WHAT WOULD YOU SAVE

if you could run your Engines TWICE as long before overhauling?

Yes, it CAN be done . . . it IS being done! In both heavy duty and light duty service — in giant Diesel-powered trucks for open pit mining, in R.R. gasoline and Diesel engines, large and small, in highway freight trucks and in other industrial and transportation fields—engines are giving 25% to 100% longer service before reconditioning—by adding POW-R-FLO to the lubricating oil as prescribed in each case by our Engineering Service.

POW-R-FLO
THE SUPPLEMENTARY LUBRICANT

Keeps Engines COMPLETELY Lubricated CLEAN and FREE RUNNING

A pure treated mineral oil — free of all impurities and residues — non-corrosive, heat-resisting, high-capillary action. POW-R-FLO INCREASES the film strength of the oil to which it is added, minimizes film friction even with heavy oils, penetrates into close tolerance and super-heated internal engine surfaces, forms a tough oily film between working parts.

DETERGENT ACTION **dissolves gummy deposits, retards accumulation of varnish, carbon and sludge; keeps sludge in suspension in the oil for easy removal by the filters. Oil stays clean and efficient much longer.**

ABSOLUTELY HARMLESS to any internal combustion motor, no matter how much is used. Yet only small quantities, used regularly, are required to do a REAL JOB!

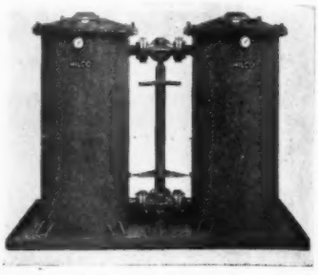
ENGINEERING SERVICE demonstrates Results

Without cost or obligation, we will run tests of POW-R-FLO Prescribed Lubrication on one of your Diesel engines in use — and let YOU be the judge of its SAVINGS in operating and upkeep costs.

Write for full information.

The Mauston Corporation
WINONA, MINNESOTA

and forcing through the Hilco Filters and bac to the tank. The duplex feature makes it pos sible to service the filters without interrupting the process of filtering the oil.



Hilco Hyflow Duplex Lube Filter

The Hilco Hyflow Oil Filters were designed t receive Fullers Earth filter elements for filtering straight run mineral oils and also cellulose type filter elements for filtering the additive heavy duty lube oils. A feature of the equipment is that they can change over from one type of filter element to the other.

Penn Electric Switch Co. Names Buchen

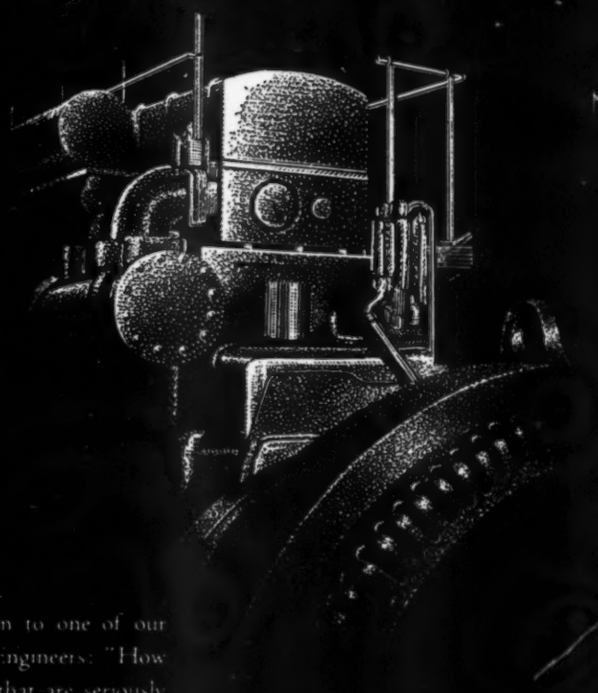
THE Buchen Company, Chicago, has been appointed advertising agency for the Penn Electric Switch Co. of Goshen, Indiana, manufacturers of automatic controls for heating, refrigeration, pump and air compressor service as well as safety controls for internal combustion engines. In announcing the appointment John R. Netedu, advertising manager of the company, said:

"We will continue to use the trade and engineering publications serving the heating, air conditioning and refrigeration industries. In addition, we will carry strong campaigns in publications going to management.

"We are of course engaged at the present time in planning our products and marketing strategy for the time when we can again return to civilian markets. We will bring to our old markets improved automatic control devices which will embody the knowledge gained from our research and experience in manufacturing controls for the armed forces.

"In addition it is planned to manufacture and market some entirely new products to fill important needs in fields in which we have never been active heretofore. Of course, advertising will play an important part in these plans. We are doing a good deal of market study at the present time, which not only serves to indicate the commercial value of these markets, but also directs us to a more efficient selling approach

EXAMPLE OF *Service*:



A large company put this problem to one of our Cities Service Diesel Lubrication Engineers: "How can we reduce Diesel breakdowns that are seriously interfering with production?"... Our engineer studied the facts and recommended a special Cities Service Diesel lubricant. In 38 months since, Diesel efficiency has been steadily maintained, with engine overhauls reduced by the amazing figure of 30%.

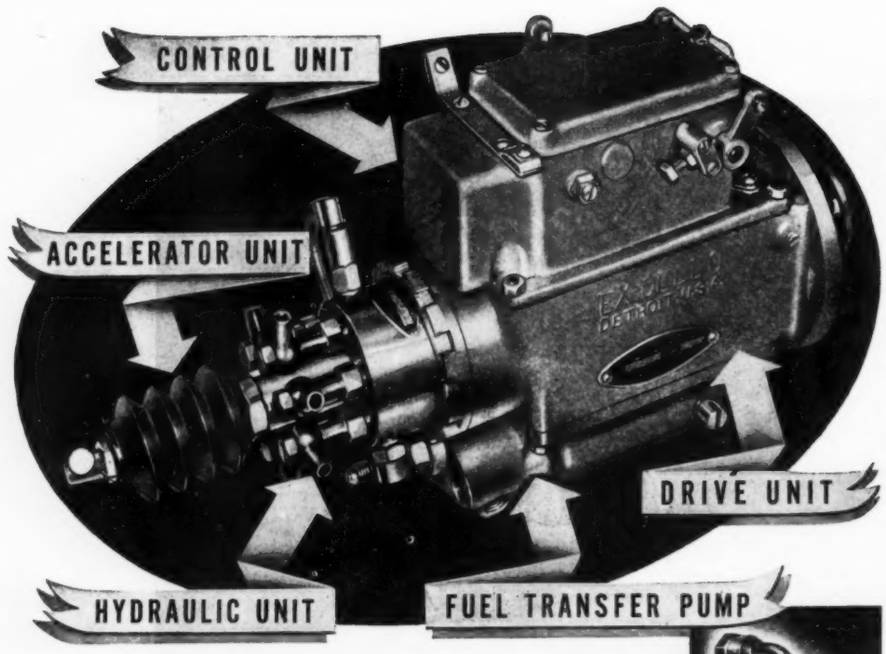
More and more, it's service that counts...

and *Cities Service* means *good service*!

CITIES SERVICE OILS — ONCE-ALWAYS

CITIES SERVICE OIL COMPANY

ARKANSAS FUEL OIL COMPANY



EX-CELL-O
Replaceable Unit Construction Provides Many Advantages

Ex-Cell-O Nozzle and Holder Assembly

The Ex-Cell-O Diesel Fuel Injection Pump is an assembly of units consisting of hydraulic, accelerator, control, and transfer pump units mounted on a drive unit arranged for flange mounting on the engine. The proven dependability of Ex-Cell-O Pumps enables this equipment to provide trouble-free operation with a minimum of service attention. However, when servicing *is* required, the Ex-Cell-O design permits convenient, time-saving, low cost, *modern* servicing by simply replacing the one unit that requires attention. Specifically:

Servicing can be done by any mechanic, with ordinary tools.

Only the particular unit requiring servicing need be sent to the depot for repairs.

The entire pump is out of service only a matter of minutes. Re-calibrating the pump in the field is not necessary, as each unit is properly calibrated before it leaves the factory.

Ex-Cell-O Fuel Injection Equipment has been thoroughly proven in the severest kind of service, both military and commercial. For complete information concerning Ex-Cell-O Diesel Fuel Injection Equipment, Diesel engine builders should address Diesel Division, Ex-Cell-O Corporation, 1200 Oakman Boulevard, Detroit 6, Michigan.

XLO
EX-CELL-O *for* PRECISION

EX-CELL-O
DIESEL FUEL INJECTION
EQUIPMENT
EX-CELL-O CORPORATION · DETROIT

"With the dislocation of normal channels of distribution, together with the necessity for educating new men who are entering the control field—manufacturers, jobbers, and dealers—advertising assumes greater importance than ever to the Penn Electric Switch Co."

West Coast Members of DEMA Meet

THE West Coast members of Diesel Engine Manufacturers Association held a meeting in the Palace Hotel, San Francisco, July 14. The association itself was represented by Harold D. Ellis, while the six spokesmen for the manufacturers were Charles G. Cox, Enterprise; G. F. Twist, Atlas; R. M. Murray, Fairbanks-Morse; W. P. Wooldridge, Joshua Hendy Iron Works; Roy F. Anderson, Lorimer; and D. R. Lain, Union Diesel Engine Co. The speakers all stressed the large expansion of manufacturing facilities and increase in output of Diesels on the West Coast in recent years, also their optimistic outlook for the post-war period.

Standing, left to right: E. B. Scott, Enterprise Engine & Foundry Co.; W. P. Wooldridge, Joshua Hendy Iron Works; Howard Oxsen, Fairbanks, Morse & Co.; Charles G. Cox, Enterprise Engine & Foundry Co.; D. R. Lain, Union Diesel Engine Co.; Seated, left to right: Gerald Brusher, Enterprise Engine & Foundry Co.; Roy F. Anderson, Lorimer Diesel Engine Co.; W. M. Griffith, Atlas Imperial Diesel Engine Co., Harold D. Ellis, Diesel Engine Manufacturers Association; R. M. Murray, Fairbanks, Morse & Co.; G. F. Twist, vice president, Atlas Imperial Diesel Engine Co.

Norma-Hoffmann Announces Executive Personnel Changes

NORMA-HOFFMANN Bearings Corporation announces the following appointments:—Mr. Robert L. Miller, assistant sales manager, to be Eastern Sales Manager; Mr. Carl W. Hedler, assistant sales manager, to be Western Sales Manager, continuing his former duties in charge of distributor sales. Mr. Miller and Mr. Hedler, both of whom have been with the Norma-Hoffmann organization for many years, will report directly to Mr. Frederick W. Mesinger, recently elected Vice-president in Charge of Sales.

Something new has been added to diesel engine cylinder liners—a new process to lengthen cylinder liner life and give the engine greater reliability—more hours of continuous operation.

Chrome-plate, applied to cylinder liner bores, multiplies liner life 4 to 20 times, ring life 3 to 5 times, and reduces the risk of piston seizure.

Every Baldwin diesel engine now coming from the production line is fitted with chrome-plated cylinder liners.

All this adds up to more satisfactory service and lower maintenance cost for your Baldwin diesel.

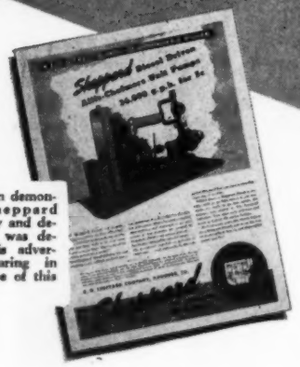
Baldwin 4-cycle diesel engines are serving railroad, marine, pipe line, power house and other industrial installations—capacities from 150 to 1,050 horsepower.

The Baldwin Locomotive Works, Locomotive & Ordnance Division, Philadelphia, Pennsylvania, U.S.A. Offices: Philadelphia, New York, Chicago, Washington, Boston, Cleveland, St. Louis, San Francisco, Houston.

BALDWIN
DIESEL ENGINES

BIG DEMAND MAY MAKE POST-WAR DIESELS SCARCE!
ORDER YOURS NOW! USE

Sheppard DIESEL Post-Priority Plan...



One installation demonstrating Sheppard Diesel economy and dependability was described in this advertisement—appearing in the July 3 issue of this magazine.

WHEN this war ends, industry will need Diesels . . . plenty of them . . . as promptly as they can be obtained. But this very need for Diesels may make them hard to get.

Protect yourself! Order your Diesels now . . . through the Sheppard Post-Priority Plan.

No Guessing About the Future . . . No Involved Procedure

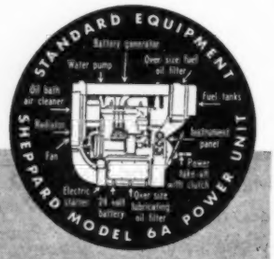
The operation of the Sheppard Plan is simplicity itself. You're not asked to guess the future. There's no involved ordering procedure.

You simply fill in the coupon below stating your estimated Diesel needs. Sheppard engineers will make a recommndation suited to your requirements. This recommendation will be accompanied by a post-priority tentative order blank.

Once this order blank is returned, your name is placed on a special preference list. Names on this list will be given first claim on post-war Sheppard Diesels.

As soon as it is possible to place your order in production, Sheppard will notify you *of delivery date. Ten days after receipt of this notice,* your tentative order becomes binding.

Using the Sheppard Post-Priority Plan is simply thinking ahead to safeguard your future. Why risk being unable to obtain Diesels at a time when you may need them critically? Write today for your tentative order blank.



Sheppard ALL AMERICAN DIESELS

R. H. SHEPPARD COMPANY
110 MIDDLE STREET, HANOVER, PA.

Please have your engineers submit a recommendation for my power needs as specified below. I understand there is no obligation for this recommendation. Also enclose a Post-Priority tentative order blank.

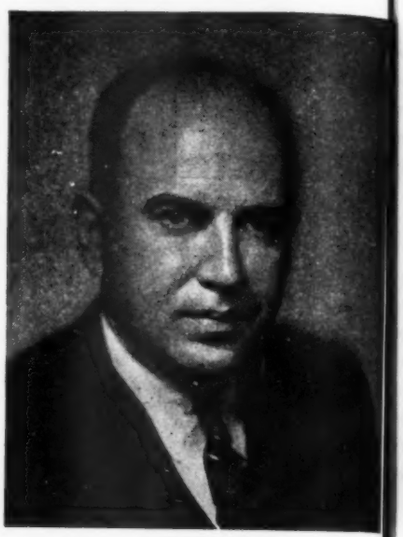
H.P. Diesel required for .....
Remarks .....
.....
(IF ABOVE SPACE IS NOT AMPLE, PASTE COUPON ON LETTERHEAD)
Company .....
Address .....
.....
By .....

IT COSTS ONLY A PENNY NOW TO BE SURE OF A DIESEL LATER

(PASTE COUPON ON POSTCARD)

Foss Heads DeBothezat's Boston District Sales

WINFRED L. FOSS has been appointed manager of its Boston district sales territory according to an announcement issued by American Machine and Metals, Inc.



Winfred L. Foss

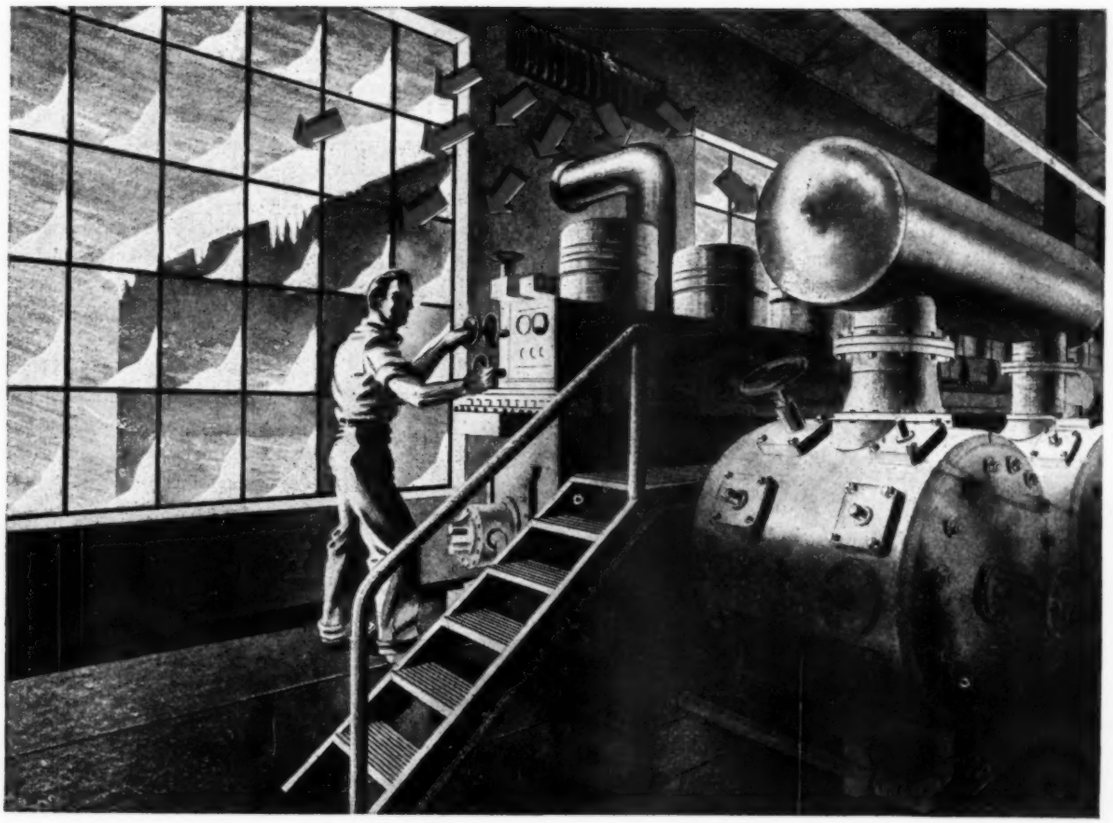
Born in Washington, D. C., Mr. Foss studied at the Massachusetts Institute of Technology and following service in World War I, at Columbia University.

Mr. Foss served as instructor and later as distributor for the Pierce Arrow Motor Car Company, subsequently becoming comptroller and treasurer for various motor truck distributors on the eastern seaboard. His work brought him to the attention of George S. May Company, who appointed him district sales manager of that organization. He later joined the Douglas T. Sterling Company as regional sales manager.

Headquarters of the Boston district offices of American Machine and Metals, Inc., of which Mr. Foss is manager, are located at 409 Park Square Building, in Boston. Included in the divisions of American Machine and Metals, Inc. under his supervision are the Troy Laundry Machinery, DeBothezat Fan, Riehle Testing Machine and Tolhurst Certrifugal.

Russell Pyles Becomes Chief Engineer of Van der Horst Corporation

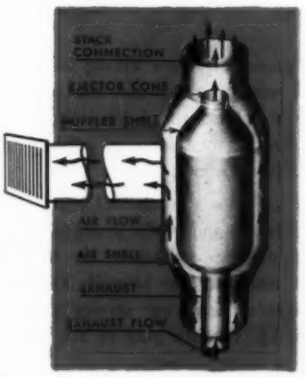
VAN der Horst Corporation of America announces the appointment of Russell Pyles, formerly with Clark Bros. Company, as chief engineer with headquarters at the home office in Olean, New York.



Turns winter into summer!

Here's a simple, inexpensive way to heat your engine rooms in cold weather... as well as to keep them cool in summer.

The average velocity of flow in the air jacket of the standard FLUOR Air-Cooled Muffler ranges from 1,500 to 3,000 feet per minute. This air is heated by contact with the muffling chamber, thus acting as a heat exchanger. A heat economizer, installed in the side of the air jacket below the exhaust gas ejector cone, provides an efficient method of heating the engine room and precludes the necessity and expense of providing auxiliary heating equipment. In warm weather, a damper shuts off the heat and the positive ventilation provided by the FLUOR Air-Cooled Muffler helps to keep the room cool.



All designs for FLUOR Air-Cooled Mufflers are fully protected by U.S. Patents and Patents Pending

SINCE 1890

FLUOR

ENGINEERS • MANUFACTURERS • CONSTRUCTORS

PROCESS PLANTS AND EQUIPMENT FOR THE OIL, GAS AND ALLIED INDUSTRIES

THE FLUOR CORPORATION, LTD., 2500 SOUTH ATLANTIC BLVD., LOS ANGELES 22 • New York, Pittsburgh, Kansas City, Houston

Willard Battery Wins Army-Navy "E" Star

UNDERSECRETARY of War Robert P. Patterson announces that Willard Storage Battery Company is being awarded a white star to be added to the Army-Navy "E" pennant won by the company's Cleveland factory in January. The star is presented for continued excellence in the production of war materiel. Willard is producing many types of storage batteries vitally needed by the U. S. armed forces and their allies all over the world, including several revolutionary new plastic-container batteries developed by the company's engineers in cooperation with Army and Navy specialists.

Bureau of Ships Investigates New Super Diesel Fuel

A HIGH cetane Diesel fuel which gives promise of having revolutionary effects is now undergoing extensive tests at one of the Bureau of Ships laboratories, Rear Admiral Edward L. Cochrane, U.S.N., Chief of the Bureau of Ships, announced today.

The tests are being conducted to determine the value of the fuel for combat service both for present and possibly new design Navy engines. The immediate use of the new fuel lies in improving the quality of low cetane fuels and augmenting the present supply of fuel for the many Diesel ships in the fleet. Its future possibilities appear to be very promising since it may make 100 cetane fuel practicable where 50 cetane is now the average for high quality Diesel fuel.

The new high cetane fuel is produced from a fluid obtained by synthesizing natural gas. The quantity of fuel which can be obtained from this source represents only a small fraction of the total fuel production now obtained from natural petroleum. Used as a blend, however, it can have important effects in improving the quality of the present low cetane petroleum fuel and increasing the over-all volume of Diesel fuel available for the fleet.

A cheap source of the basic high cetane fluid is natural gas now vented into the air or wasted in uneconomical uses. The process by which the fuel is produced requires a minimum of critical alloy steel and will employ catalytic technology developed by the synthetic rubber and aviation gasoline programs. The work, being carried on under the direction of the Research and Standards Branch of the Bureau of Ships, indicates that this process will make a considerable quantity of a valuable war fuel available to aid in relieving the critical shortage of petroleum products.

New Hydraulic Gauge Bulletin

A FOUR-page bulletin describing and illustrating several types of hydraulic gauges has just been issued by the Watson-Stillman Company. This publication covers the company's Direct Stem and Flush Mounted Gauges for use on hydraulic presses and pumps where accurate, trouble-free indication of hydraulic pressures is essential.

The Direct Stem Type Gauges are beaded for direct stem mounting and are applicable to hydraulic presses and pumps for pressures ranging from 1,000 to 30,000 pounds per square inch. Dial sizes are 4½", 6", 8½" and 12". Standard graduations "LBS. PER SQ. IN." are marked on dials, or if specified, gauges will be furnished marked "TONS PER RAM," or supplied with both graduations. This gauge has a zero re-setting device.

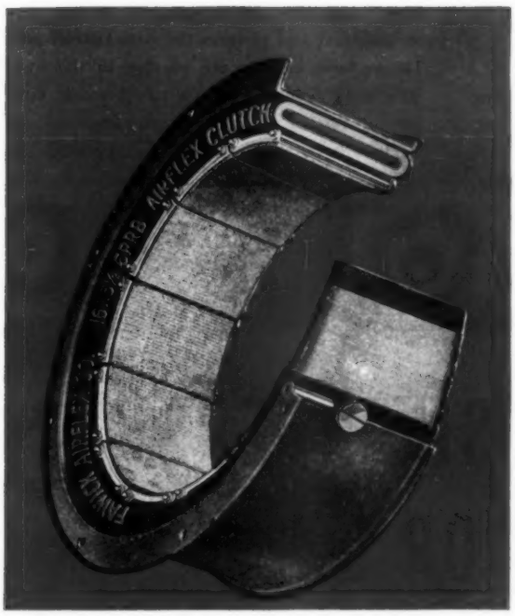
As Sterling announces its new Viking Diesel, with justifiable pride — we too are proud that our microscopic precision drilling service, in drilling the fuel injection nozzles, was found acceptable to the designers and builders of this fine-running engine.

We have specialized for a number of years in the drilling of Diesel fuel nozzles and in the production of drills and super-sensitive drilling machines for the drilling of nozzles by the manufacturer himself. The list of Diesel engine manufacturers using our service and our products is rapidly growing. We are glad to add the new Sterling Viking Diesel to the list.

"This Is The Only Business Of Its Kind In The World"

National Jet Company

115 MILTON PLACE CUMBERLAND MARYLAND



This Clutch has a War Record

Performance under the severest conditions—that's the uniform comment of users of the Fawick Airflex Clutch.

This new, but tried and proved, clutch controls power by air pressure. It absorbs shocks and vibration, without moving parts, arms, levers or springs. Requires no adjustments, no lubrication—maintenance costs are very low. Operates as clutch, brake, slip-clutch or flexible coupling.

In Naval use, under combat conditions, the Fawick Airflex Clutch gives a degree of maneuverability and dependability never before known!

It has also proved itself for heavy duty drives in such industries as steel, paper, rubber, material handling, mining, petroleum, electric power, metal forming and dredging.

Consult us on your difficult clutch installations. Our engineering department will gladly advise with you.

12 IMPORTANT ADVANTAGES

1. Simple in design and operation.
2. Flexible control by air.
3. No adjustments or oiling—low maintenance.
4. Dampens vibration—absorbs shocks.
5. Corrects misalignment automatically.
6. Smooth starting—no jerks.
7. Runs cooler—uniform pressure.
8. Controls torque by air pressure.
9. Greater capacity—more compact.
10. Remote control by air valve.
11. Replaces couplings.
12. Acts as clutch, slip-clutch or brake.

FAWICK AIRFLEX COMPANY, INC.
9919 Clinton Rd. Cleveland 11, Ohio

In Canada, **Ronald-Coventry Ltd., 1006 Mountain St., Montreal, Canada**

In Britain, **Crofts Engineers, Ltd., Bradford, England**

FAWICK *Airflex* CLUTCH

POWER CONTROLLED BY AIR

The Flush Mounted Type Gauges are flanged for flush mounting on panel or gauge board and will register pressures up to 10,000 pounds per square inch. Dial sizes are 4½", 6", 8", 10" and 12".

Known as Bulletin 230-A it gives specifications and construction in detail. Copies will be sent if requested on company letterhead, and addressed to the Watson-Stillman Company, Roselle, N. J.

Gray Marine Announces "Detroit Story"

IN a new ten-page brochure, Gray Marine Motor Company dramatizes with interest absorbing text and pictures the part Detroit and Detroit-built engines are playing in the war. The story points to Detroit as a young city, full of restless energy, contemptuous of obstacles—always accomplishing the impossible. It tells how Gray Marine has grown up in and become a part of this atmosphere and how the great industries of this city have amply met their share of the Nation's wartime needs for the things they knew best how to produce. A most attractive and interesting booklet is "Detroit Story"—Gray Marine Motor Co., Detroit, Michigan, will be glad to send you a copy if you write them.

EXHAUST SILENCERS... WET OR DRY

EVER SINCE we perfected the VORTEX dry, spark-arresting exhaust silencer for Diesels, we have leaned toward this type for low maintenance cost and general all-around efficiency.

So has a big proportion of Diesel operators.

But when war came to America, it presented certain problems for marine Diesels which could best be met by the wet type muffler.

Therefore, we of the Engineering Specialties Company — at the request of our combat forces afloat — went to work to develop the most satisfactory wet type muffler possible within the many confining limits such exhaust silencing imposes.

Today, there are hundreds of newly-designed VORTEX-built wet silencers in use by our armed services . . . sludge-free, corrosion-proof and as simplified and efficient as a wet muffler ever can be.

They are, frankly, surprisingly good . . . a far cry from the early "wet pots" of years ago.

So good, in fact, that we plan to continue to produce them after the war along with our highly-favored dry, spark-arresting type silencers.

VORTEX

SILENCERS (WET OR DRY TYPES)

SPARK ARRESTERS • SPARK ARRESTER SILENCERS

ENGINEERING SPECIALTIES CO., INC. • 39 CORTLANDT STREET • NEW YORK 7

Aircraft Accessories Elects John B. Walker Vice President

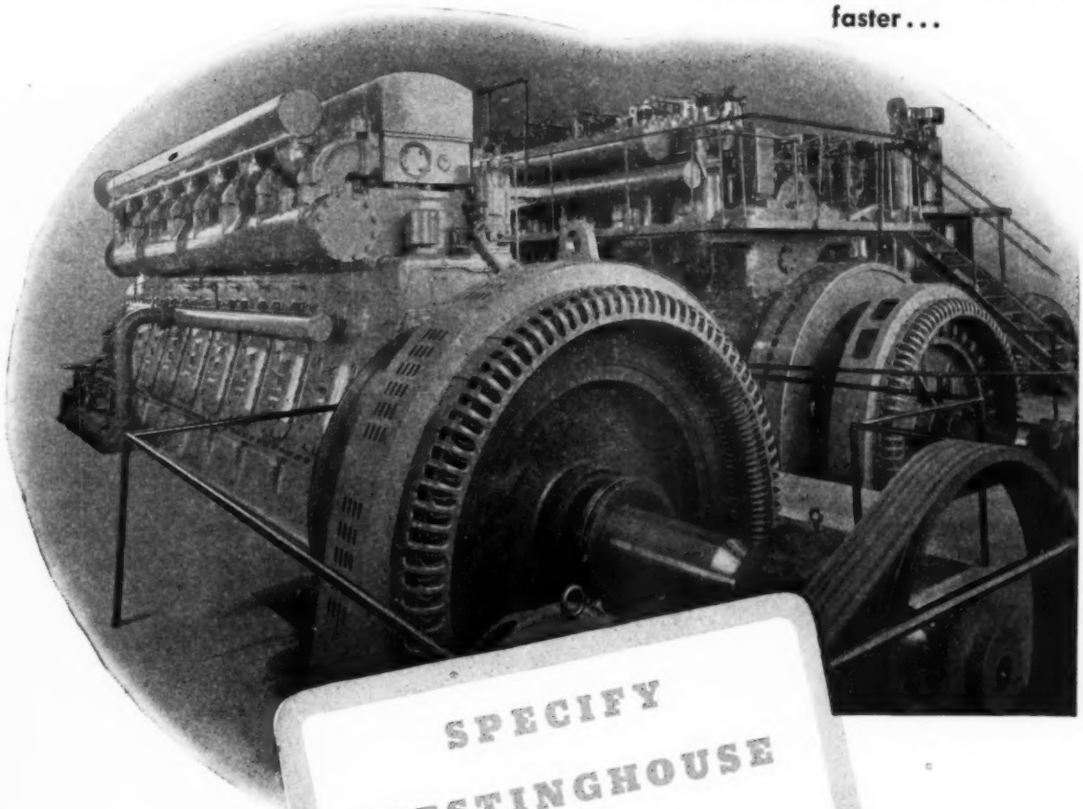
JOHN B. "JOHNNY" WALKER, widely known transportation and sales executive, was recently elected vice-president in charge of sales of the Aircraft Accessories Corporation, Kansas City, Kansas. The announcement was made by Randolph C. Walker, president of the corporation. The Walkers are not related.

John B. Walker

John B. Walker has served the past two years as a director of the company. In his new position he will direct the present and post-war sales program of the Aircraft Accessories Corporation, including the newly developed lines of railroad electronic communication equipment, and the hydraulic, air and vacuum brake line for the automotive field. His headquarters will be the New York offices of the corporation at 60 East 42 Street.

Mr. Walker comes to Aircraft Accessories from United Air Lines, where he was assistant to the president. His experience includes ten years in the executive sales departments of Transcontinental & Western Air and United Air Lines; five years as vice-president, sales and traffic manager of Greyhound Bus Lines, and several years as an advertising agency executive. Mr. Walker is a native of Fayetteville, Arkansas.

No. 1 TIP for getting Diesel power on the job faster...



get the complete electrical equipment from one responsible source

Split responsibility for electrical equipment means delays... lost time... confusion... both in ordering and installation, and when servicing or maintenance is necessary. Westinghouse offers three-way help in getting Diesel-generated power on the job—and keeping it there:

One Responsible Source—Westinghouse supplies the complete electrical equipment required for the installation—generators, exciters, voltage regulators, switchboards, circuit breakers, transformers, auxiliary equipment and controls. Time is saved in negotiation... full responsibility for electrical co-ordination is assumed by Westinghouse engineers.

Matched Equipment—Westinghouse generators are built to match the characteristics of the Diesel engines you purchase, regardless of make.

24-Hour-Per-Day Service—Thirty-three strategically located Westinghouse service shops provide round-the-clock service for all your electrical equipment.

For more information, call your nearest Westinghouse office or write for B-3028, "A-C Generators for Diesel Engine Drives." Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. J-10264

Westinghouse

PLANTS IN 25 CITIES... OFFICES EVERYWHERE

A-C GENERATORS FOR DIESEL ENGINE DRIVES

Wright-Austin Announces A New Marine Bulletin

A FORTY-FOUR page illustrated bulletin covering its extensive line of marine steam specialties was recently issued by Wright-Austin Company. Of special interest to the Diesel field —both stationary and marine is the Whirlwind-type compressed air purifier described in this bulletin. This simple device, having no moving parts, is said to remove moisture and oil from compressed air up to 600 pounds working pressure. For full particulars address Wright-Austin Company, 515 West Woodbridge Street, Detroit, Michigan, requesting Bulletin 40.

Pomona Pump Administration Moves to Main Hendy Plant

THE chief administrative offices of the Pomona Pump division of the Joshua Hendy Iron Works have been moved to Sunnyvale, Calif., for a consolidation with the general administration of the company. Affected by the change are the sales, engineering, purchasing and accounting departments.

Among the number of those moving their offices north are Arnold Brown, sales manager; A. W. Moore, advertising manager, and Ralph Linderman, export manager. All manufacturing activities will continue to be carried on in the Southern California plants at Pomona and Torrance, with Charles L. Barrett as plant manager for both.

ENGINEERING
THE ARROW
THE CLUB
THE AXE
THE ARROW
. . . each was an important step upward on the ladder of the ages. Each embodied the elimination of weight and gave more power and greater range to the hand of man. Each required the highest engineering and production skill of its day. Today the Guiberson Diesel, backed by more than 25 years of precision production of oil tools and more than 15 years of engineering and production of diesel engines, is the fleet arrow of tomorrow's transportation on sea, on land and in the air. It is the light weight power plant that is safer, more economical and more efficient.
PRODUCERS OF OIL TOOLS, OIL HEATING UNITS, AIRCRAFT PARTS AND DIESELS
Guiberson
U·S·A
Dallas, Texas
GUIBERSON DIESEL ENGINE CO.
THE GUIBERSON CORPORATION

Sauppee Heads DeBothezat's St. Louis District Sales

BENTON J. SAUPPEE has been appointed district sales manager of the St. Louis district territory according to an announcement by American Machine and Metals, Inc.

Benton J. Sauppee

A native of Pennsylvania and a graduate of electrical engineering at the University of Michigan, Mr. Sauppee was early associated with the Rochester Gas & Electric Corporation and later with Binghamton Light, Heat & Power Company where he directed power and lighting sales. Subsequently, was appointed superintendent of operations and a member of the board of directors of Kentucky-Tennessee Light & Power Company. Recently he has been engaged in professional engineering services in the states of Kentucky and Tennessee.

Mr. Sauppee has established district offices of American Machine and Metals, Inc., in the Arcade Building, Eighth and Olive Streets, St. Louis. He will supervise the sales and service activities of his company for their Troy Laundry Machinery, DeBothezat Fan, Riehle Testing Machine and Tolhurst Centrifugal divisions.

WHAT'S NEW ON THE WATERFRONT?

MARINE PRODUCTS "MANY PURPOSE" PUMPS are available in several series ranging in capacity from 40 to 400 g.p.m. Consult your naval architect, boat builder, engine manufacturer and marine supply dealer about these installable, workable, provable marine engineered pumps and you will never go back to cumbersome, tinkersome equipment. Send for literature.

KEEP 'EM FLOATING!

Take a look at these and other Marine Products accessories now on display at leading marine supply dealers from coast to coast.

WAR-PROVED ACCESSORIES FOR POSTWAR BOATS

Fishermen and owners of essential work boats are quick to take advantage of the opportunity to use war-proved accessories...the marine engineered equipment used on landing craft, PTs, amphibian tractors, and many others.

Hundreds of fish boats are now equipped with the "Chore Boy" . . . the improved type "all-purpose" centrifugal pump that pitches out bilge water at a rate up to 400 G.P.M., and does many other pumping and circulating jobs as well . . . the pump that can be run continuously, wet or dry, and won't clog with fish scales or sediment.

You'll also want the latest developments in Marine Products clutch and throttle controls that are a revelation in simplified boat handling.

MARINE PRODUCTS CO.

6636 CHARLEVOIX AVE. DETROIT 7, MICHIGAN

MARINE ENGINEERED EQUIPMENT

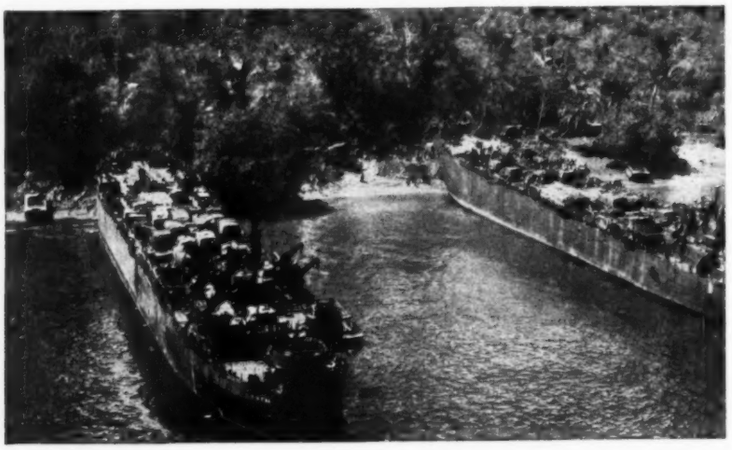
The Diesel Age

UNDER this title the following editorial appeared in the July 29th edition of the Chicago Daily Drovers Journal.

Civilization down through the centuries has had its ages—stone, iron, steam, electric and gasoline—to name a few. And unless all signs fail, a new age is ready to be born, the Diesel age. Even before the war, the use of Diesel power for trucks, tractors, buses and even railway locomotives was expanding, and the record which this type of motor has made during the war in the handling of all sorts of loads speedily and economically is one which industrial leaders are scanning carefully with an eye to future possibilities.

Not long ago a raliroad executive sat in his private car on a siding and watched a freight train roll by. "One hundred twenty-seven cars on that train," he announced to a group of guests after the caboose had passed. "And maybe you didn't notice it, but the locomotive was one of those new big Diesels that we have started to use in our freight service. They'll haul larger loads over steeper grades than our biggest steam locomotives. It's too bad we didn't have more of them in service when the war started, but those we do have are one of the answers to the question, 'How are the railroads doing it?' Several more are being built for our road now, and we expect to put many in service as rapidly as possible when the war ends."

Diesel power originally came to public attention with the advent of the light, speedy, streamlined type of passenger train. But developments of the last few years, first in conversion to Diesels for switch engines in railroad yards and now, on a much larger scale, for all types of rail power, indicate that the Diesel age has really been born. Use of Diesel motors for highway transportation also was expanding when the war put a temporary halt to automotive development, and in view of the well-known genius of American industry for adaptation, it will not be surprising if pleasure cars, powered by modified Diesels, are on the market within a relatively short time after automobile production is resumed.



Official U. S. Navy Photograph

Another Beach-head Won!

HEAVILY-LOADED LST ships abut onto the shore of Tanahmerah Bay in the Hollandia area of Dutch New Guinea as U. S. troops and machines of war score another Victory.

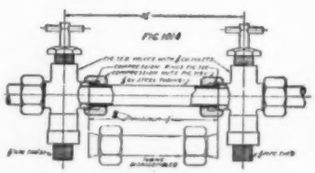
We are proud to have a part in the nation's vast landing craft program. For nearly two years Nugent has been furnishing Fuel Oil Filters, Lubricating Oil Filters, Compression Fittings and Sight Flow Fittings for LST ships. Where these "fighting truck horses" carry on, material and equipment must be dependable.

In wartime or peacetime there's a full-time job for the product that can do the job better. That's why Nugent Filters and Oiling Devices, for 46 years, have been so popular in the marine field. Nugent's long experience in the field of oil handling and filtration is available to help you on your own specific oil conservation problem. Write us today for bulletins.

NUGENT LUBRICATING OIL FILTERS
Pressure type filter for all kinds of oils. Has 20 times more filtering area than most filters of comparable size.

FIG. 1116-HA & 4R
NUGENT DUPLEX FUEL OIL FILTERS
Special woven, acid resisting, lintless filter element removes particles as small as .0003". Offered in a wide range of sizes.

Wm. W. Nugent & Co., Inc.
415 N. Hermitage Ave.
Chicago 22, Ill.

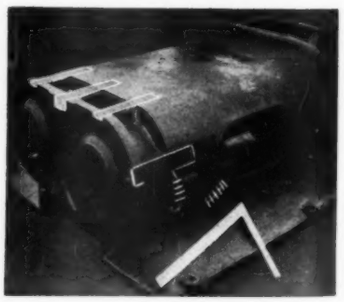


NUGENT Needle Point VENT VALVES
Diagram shows vent valves with "close-up" compression fittings on Multi-Stage Pumps. Valves will not leak nor wear out.

FIG. 1116SV-D
NUGENT SIGHT FLOW FITTING
Bursting pressure of glass 400 to 600 lbs.

NUGENT FILTERS

Broken Diesel Engine Repaired by "Metalock" Cold Processes



THIS Diesel Engine Frame for a Drilling Company in Powell, Wyoming was accidentally broken almost completely apart in transportation. The repair was accomplished through the use of Masterlocks, Metalocks and Metalace Cold Repair Processes, which restored the original alignments without machining and restored the necessary strength with a safety factor of approximately 10-1. The repair required only 48 hours, after which the engine was reassembled and put into operation. Many such money-and-time saving jobs are done on location, without dismantling, on both ferrous and non-ferrous metals by the Metalock Casting Repair Service.

Every Diesel Operator

KNOWS that carbon is the cause of many of his troubles. That carbon formation, *if unchecked,* may cause stuck rings, blow-by, loss of power, excessive wear, and frequent, costly shut-downs for overhaul . . . That the high compression, high temperatures and maximum loads under which Diesel engines operate, tend to "break down" the lubricating oil . . .

BUT SOME DIESEL OPERATORS MAY NOT KNOW . . .

Before Using Ring-Free

After Using Ring-Free

that Macmillan Ring-Free Motor Oil will remove carbon, and prevent the accumulation of hard carbon deposits . . . that Macmillan Ring-Free Motor Oil has *exceptional film strength.* That its high heat resistance, thorough penetration and long cling . . . in other words, its *superior lubricating qualities* reduce power loss and *increase engine life.*

WANT POSITIVE PROOF? Here at Macmillan, we *know* that Ring-Free will do these things . . . will live up to every claim we make for it. We know this because constant laboratory tests, and *performance records of Ring-Free users everywhere prove it.*

Let a Macmillan Engineer arrange to test Ring-Free on your job, in your own equipment. Then you, too, will have positive proof of Ring-Free's superiority!

MACMILLAN PETROLEUM CORPORATION

50 West 50th Street, New York 20, N.Y.; 624 S. Michigan Avenue, Chicago 5, Ill.; 530 West Sixth Street, Los Angeles 14, Calif.

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Macmillan Petroleum Corp.

National Supply Elects John B. Mensing

THE National Supply Company announces the election of John B. Mensing as Assistant Treasurer. Mr. Mensing has been associated with National for twenty-five years, beginning in the Credit Department at Toledo, Ohio, on March 17, 1919.

Later transfers took him to Fort Worth, Texas; Independence, Kansas, and then to the head office in Pittsburgh, where he was Chief Clerk of the Pittsburgh Credit Department for ten years and later Assistant to the Treasurer.

New Caterpillar Booklet Looks to Post-War Road Construction

LOOKING ahead to the period following the war, when municipal users of road building and maintenance equipment will again be reconditioning old and constructing new highways, a new booklet issued by Caterpillar Tractor Co. anticipates the tasks which will face city, county and state road officials and equipment operators.

The booklet, 16 pages in two colors, may be obtained by writing "Caterpillar" at Peoria, Illinois and asking for "A Look Up The Road," Form No. 8587.

Shallow Draft and Mobile Crane are Features of New Type Diesel Cargo Ship

A NEW type, large capacity cargo ship with exceptionally shallow draft for navigating close to beachheads in many inland waters and near dock facilities meant only for much smaller vessels is now in service supplying our fighting forces with essential war material.

The "Asa Lothrop," a new type shallow draft cargo ship with Diesel propulsion and auxiliary engines.

The *Asa Lothrop*, one of the first of these Diesel-driven craft, is shown in the accompanying illustration. Besides the shallow draft feature, the ship is equipped with a heavy duty mobile crane for easy loading and unloading. The crane, which is visible amidships, is independently powered by another Diesel engine for moving the entire unit to any position along the length of the deck and for operating the boom.

Designed by the firm of Thomas D. Bowes, Philadelphia, Pa., the *Asa Lothrop* is said to have ushered in a new type cargo service which is destined to make a strong bid for world trade after the war. It can operate in many parts and places heretofore inaccessible to conventional ships of this size and capacity. Propulsion and crane engines are Cooper-Bessemer Diesels.

The Cooper-Bessemer Diesels on the *Asa Lothrop* are typical of the thousands of horsepower being supplied by this engine builder for scores of other military craft of all descriptions.

Mack Names Three New District Managers

APPOINTMENT of three new district managers of the Mack truck company has been an-

GRINDING TO SPECIFICATIONS
Typical of many special bolts for engine builders is this Erie Alloy Heat Treated Bolt—ground to an exceptionally close tolerance on the bearing area—threaded to Class 3 fit.
Engine manufacturers are exacting in bolting specifications. They know that Erie, as a specialist, is equipped to meet high quality demands for close-tolerance alloy bolts and studs. We become essentially a specialized department of your company for the production of bolting to your material, heat treating, grinding and threading requirements. Send us your bolting specifications.
This Erie Alloy Stud is specially heat treated with recess portion turned and ground to exacting engine builder specifications.

ERIE Bolting ALLOYS • STAINLESS CARBON • BRONZE

ERIE BOLT & NUT COMPANY • Erie, Pa.

295 ENGINES *described--profusely illustrated*

Alco Diesels for Universal Application
Alco Stationary Diesels
Alco Sulzer Diesels
Anderson Model KD
Atlas Imperial Stationary Diesels
Atlas Imperial Industrial Diesels
Atlas Imperial Marine Diesels
Atlas Lanova Diesels
Baldwin Model VG Diesels
Baldwin Model VO and VM Diesels
Baldwin Series 10 Diesels
Buckeye Model "70" Diesels
Buckeye Series "80" Diesels
Buda-Lanova General Purpose Diesels
Busch-Sulzer Bros. 2-cycle Diesels
Busch-Sulzer Bros. 4-cycle Diesels
Caterpillar Automotive Diesels
Caterpillar Industrial Diesels
Caterpillar Marine Diesels
Chicago Pneumatic Models 8 & 9 CP
Chicago Pneumatic Type 16-CP
Chicago Pneumatic Type 112 and 114 CP
Chrysler Industrial Diesels
Chrysler Marine Diesels
Clark Bros. Convertible Gas Diesels
Clark Bros. Models SD and MD
Climax Models D 148 and D 297
Cooper-Bessemer Types GN and EN
Cooper-Bessemer Type JS
Cooper-Bessemer Type LS
Cummins Model A Diesel
Cummins Model H and HS
Cummins Model L
Cummins Fuel Injection System
Dodge Lanova Diesel
Enterprise Standard & Supercharged Diesels
Fairbanks-Morse Model 38 "OP" Diesel
Fairbanks-Morse 2-cycle Types 33 and 37
Fairbanks-Morse 2-cycle Model 32
Fairbanks-Morse 2-cycle Model 35
Fairbanks-Morse 2-cycle Model 36
Fairbanks-Morse 4-cycle Model 32
Fulton Iron Works Co. Models RR, BGS and KS
General Motors Model 71
General Motors Model 567
Gray Marine Diesels
Gunderson Radial Diesels
Hamilton Double Acting Diesels
Hamilton Single Acting Diesels
Joshua Hendy Series 50 Diesels
Hercules Automotive Diesels
Hill Model R Diesels
Ingersoll-Rand Type "S"
International Tractor and Industrial Types
Kahlenberg Marine and Stationary Diesels
Kermath 4-cycle Marine Conversions
Lathrop Types D-50 and D-80
Lister-Blackstone Models CD and CE
Lorimer Slow Speed Heavy Duty Diesels
Mack-Lanova Trucks, Bus and Marine
Murphy Marine Diesels
Murphy ME Series Diesels
Nordberg Convertible Diesel-Gas Engines
Nordberg 2-cycle Diesels
Palmer Bros. Type RND
Rathbun-Jones Diesel and Gas Engines
John Reiner Diesel Marine Auxiliary Units
Sheppard Models 6 and 7
Superior (National Supply Co.) Models A and D
Superior (National Supply Co.) Types M and S
Union Marine and Stationary Diesels
United States Motors Diesel-Electric Plants
Venn-Severin Model HC
Venn-Severin Model HCV
Venn-Severin Model M
Washington Industrial and Marine Diesels
Waukesha Hesselman Industrial Type
Waukesha Multi-fuel Oil Engines
Witte Diesels and Diesel Electric Plants
Wolverine 2- and 4-cycle Diesels
Worthington 4-cycle Diesels
Worthington Models BB, CC, DD, and EE

EQUIPMENT DESCRIBED

Adeco Fuel Injection Equipment
American Bosch Fuel Injection Equipment
Bemco Fuel Injection Equipment
Bendix Scintilla Fuel Injection Equipment
Bix-Cell-O Fuel Injection Equipment
American Blower Hydraulic Couplings
Curabla Pump Valve Service
Diamond Chain Drives
Morse Chain Drives
Roots Connersville Supercharging Blowers
R-W, formerly McCulloch, Roots Type Superchargers
Elliott (Buchi System) Turbochargers
Elliott Electromagnetic Slip Couplings

$5.00

JUST OFF THE PRESS

VOLUME NINE

ORDER YOUR COPY OF VOLUME 9 NOW

DIESEL ENGINES, INC.—Two West Forty-Fifth Street—New York 19, N. Y.

Enter my order today for a copy of the New Diesel Engine Catalog, Volume Nine, Edited by Rex W. Wadman, for which I enclose $5.00.

NAME: .....

ADDRESS: .....

PLEASE PRINT NAME AND ADDRESS

nounced by F. F. Staniford, president of Mack-International Motor Truck Corporation.

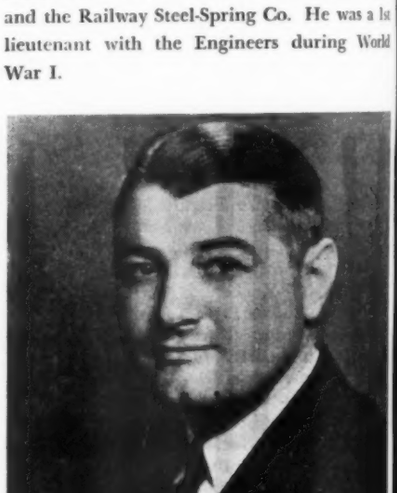
In the Northeastern Division, E. W. Turnbull, formerly assistant division manager, takes over the Akron Branch as district manager, while E. W. Atherton, formerly manager in Akron, assumes the duties of district manager in the division's Albany Branch. In the Southern Division, J. A. Bascle, formerly a marine engine salesman for Mack, is district manager of the New Orleans Branch. The appointments became effective the first of the month.

Hunter Michaels and Hugh Corrough Named Directors of Their Divisions

HUNTER MICHAELS, Sales Manager, Railway Steel Spring Division and Hugh Corrough, Division Manager of Alco Products Division of American Locomotive Company have both been named directors of their respective divisions of the company, Duncan W. Fraser, president has announced.

Hunter Michaels

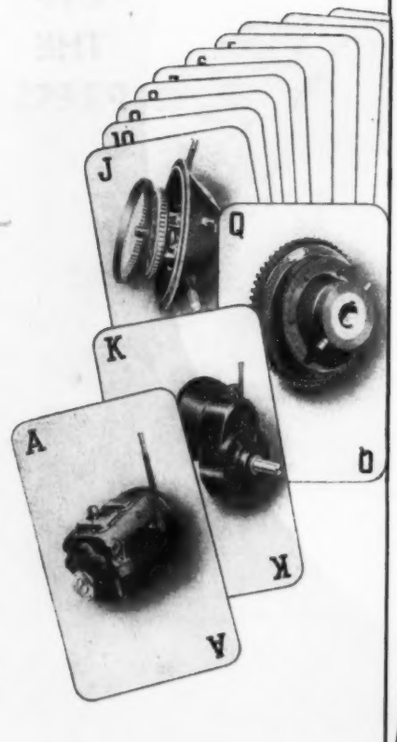
Mr. Michaels has been with the company since 1927. Prior to that time he was connected with the National Dump Car Co., the American Car and Foundry Co., the Hart-Otis Co., Rodger Ballast Car Co., Union Metal Products Co. and the Railway Steel-Spring Co. He was a 1st lieutenant with the Engineers during World War I.



Hugh Corrough

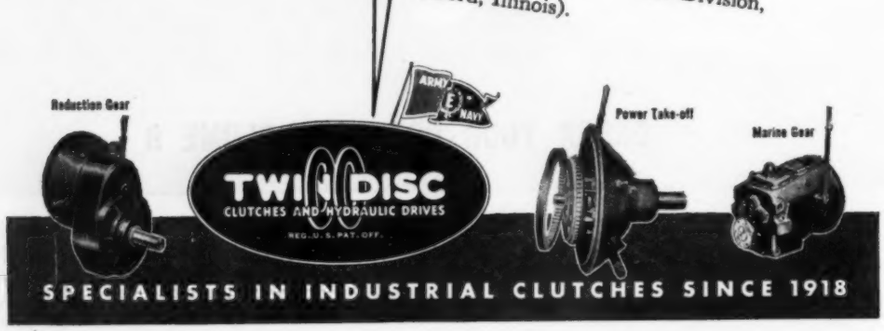
Mr. Corrough has been with Alco Products Division of the company since June, 1936, and served in the capacities of chief mechanical engineer, Assistant-Manager of Engineering, Manager-Engineering, and Manager of Alco Products Division. He is a graduate of Iowa State College and was connected with the Empire Oil and Refining Company in various

LENGTH and STRENGTH



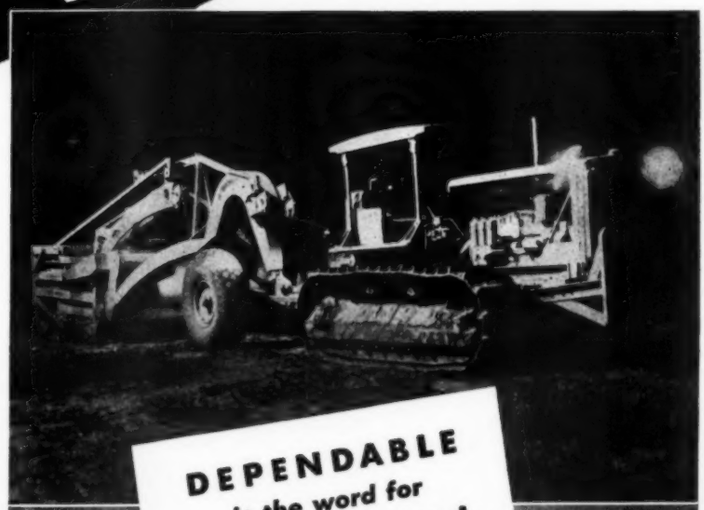
The pertinent data which is constantly relayed to the Twin Disc factory, plus the cooperation of those who design industry's machinery and tools, provides the broad basis on which the Twin Disc line of *standard* clutch units has been developed. This line has grown to so comprehensive a length that within its various models and sizes, you will find the particular friction clutch or hydraulic drive you need.

The records of thousands of diversified applications prove the strength of this line of standard clutches . . . their uniform performance and ample wear-life. To further assure this sustained leadership, the Twin Disc Clutch Company established 7 factory branches and 30 parts stations where engineering counsel is available and ample stocks of replacement parts are conveniently located. TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division, Rockford, Illinois).

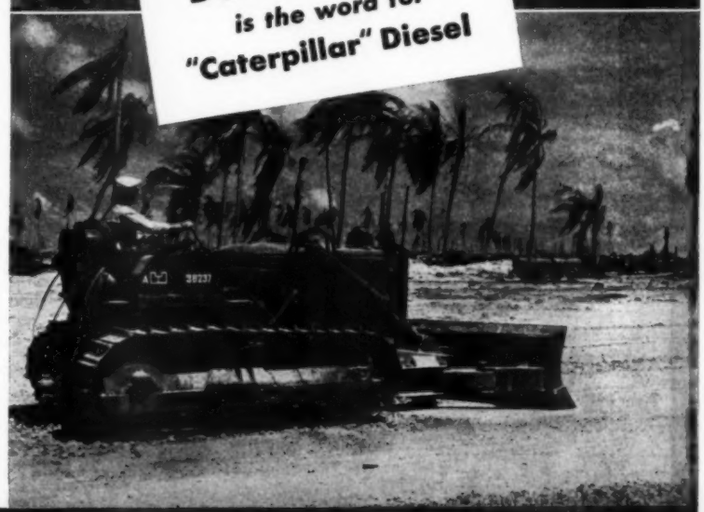


SPECIALISTS IN INDUSTRIAL CLUTCHES SINCE 1918

First-Class Fighting Machine



DEPENDABLE
is the word for
"Caterpillar" Diesel



TALK to a fighting man back from battle and you'll hear him speak of "Caterpillar" Diesel equipment with affection. He knows that, out there, when they need "workpower" they count on "Caterpillar" Diesels. War dramatizes the dependability of these husky power-plants. For a single power failure may cost lives.

The real background of "Caterpillar" dependability goes back to the years before the war. It was on the highways, on construction jobs, in logging camps and oil fields and on farms that "Caterpillar" Diesels matched their strength and willingness to work against the toughest kinds of jobs.

Through those years, the men who built them were watching them perform. Owners of "Caterpillar" equipment were urged to give it more and harder work to do. After many thousands of hours of service, engines were torn down and studied. At the first sign of an on-the-job weakness—no matter how slight—"Caterpillar" trouble-shooters went after it . . . *and corrected it!*

So, when war needs called for dependable power, it was just a question of stepping up production of the same machines which had been proved over so many years.

When the war is done, the biggest production of "Caterpillar" Diesel Tractors, Motor Graders, Engines and Electric Sets in all history will be ready to tackle the countless tasks that peace will bring. They won't be streamlined "dream" models, but they will be modern, battle-tested "Caterpillar" Diesels—the same kind that are with the Allied troops around the world today.

Meanwhile, your "Caterpillar" dealer is equipped to render complete and efficient service to help keep your present "Caterpillar" equipment on the job—working at peak efficiency.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

CATERPILLAR DIESEL

REG. U.S. PAT. OFF.

TO WIN THE WAR: WORK—FIGHT—BUY U. S. WAR BONDS!

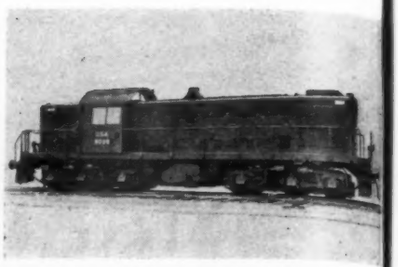
capacities from 1923 until 1934, when he became associated with the Cities Service Oil Company as an executive.

Perfect Circle Promotes Richard Conder

W. BLAIR HARTLEY, General Purchasing Agent, Perfect Circle Company, announces the appointment of Richard Conder as Purchasing Agent of the Hagerstown Plant. He succeeds Robert Borst who joined the U. S. Navy. Until his advancement, Mr. Conder was Assistant Purchasing Agent.

Alco-G.E. Diesel-Electrics Speed Lend-Lease Shipments to U.S.S.R.

FOR nearly 18 months, a fleet of American Locomotive-General Electric Diesel-electric locomotives have been speeding American lend-lease shipments of food and armaments to the U.S.S.R. over the single-track Trans-Iranian Railroad. Through desert heat and over rugged mountains where there are 220 tunnels in the 400 miles from the Gulf to Teheran, these locomotives, equipped with six motors and 1600-gallon fuel tanks, carry 900-ton loads on fast, nonstop schedules.



Alco: G-E, 1000 hp. Diesel-electric locomotive, one of a fleet operated by U. S. Army transportation corps on Trans-Iranian Railway.

Two units are used to haul the heavy trains over the 1.4 per cent ruling grade of this tortuous run. When the 130-degree desert temperature reduces the crew, a single crew operates the two units in multiple. The Alco-G. E. units require no more than periodic inspection and normal maintenance. These needs are taken care of by natives, trained and supervised by former American railroaders, in khaki for the duration.

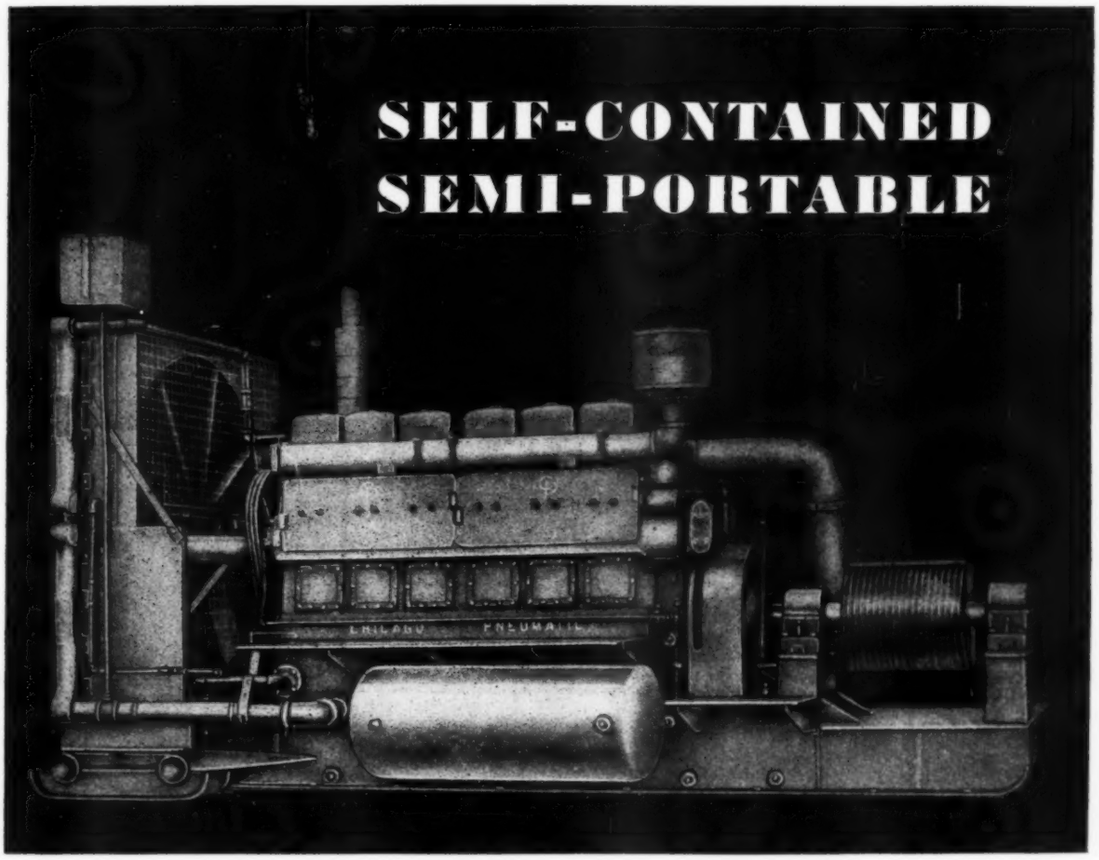
Before the war, there were two passenger trains a week operating on the line—the only railroad in Iran—and all traffic was controlled by a single-phone circuit between Teheran and the Gulf. If the "up" train was five hours late, the "down" train waited on the prescribed siding where they were to pass. Today there are daily express trains in both directions. This line, spanning Iran from the Gulf to the Caspian, carries more than half the load of Russian supplies across Iran. At the railroad dispatcher's office at any division point along the line, a staff of sergeants who learned the lingo of their business long before they sailed from the United States keep the Diesel-electrics moving. American equipment—four-wheel-truck freight cars with automatic brakes; a complete telephone and teletype service for dispatching trains; half a dozen automobile-engine, all-weather inspection cars; and powerful headlights for the locomotives (they formerly ran without headlights—is in evidence up and down the line.

The transport miracle in Persia is an accomplished fact.

Cleveland Diesel Wins Fourth Army-Navy "E" Star—Awarded for One Year

THE Cleveland Diesel Engine Division of General Motors has been awarded a fourth star on its Army-Navy "E" burgee, it has been announced. The star was awarded for a period of one year, according to Rear Admiral C. C. Bloch, USN (Ret.), because of the production record maintained by the company since the original "E" flag was awarded in May, 1942.

PRELUDE TO INVASION
Born of American ingenuity, these "ugly ducklings" (LST), equipped with Wittek Hose Clamps, are aiding the Allied cause immeasurably as one of the most effective and startling types of ships the war has produced. Official U. S. Navy Photograph.
Dependable Hose Connections For Diesels Assured with
WITTEK
HOSE CLAMPS
Type FBC
Type RN
Type RM
Type RW
Because of their design, construction and ease of installation, Wittek Hose Clamps assure dependable hose connections for Diesel engine builders. Long accepted by the automotive and aviation industries, Wittek Hose Clamps are now being proven in actual service with the armed forces of the United Nations as standard equipment for LST's and Half Tracks shown above as well as aircraft, tanks, jeeps, trucks, ships and other combat vehicles. Wittek Hose Clamps are made in many different sizes and types for Diesel applications: Type RW for hose connections of 5" in diameter and larger; Type RM for 3½" to 5"; Type RN for 2½" to 3½" and Type FBC for 2½" hose connections and smaller. Write for complete catalog.
Wittek Manufacturing Co., 4305-15 W. 24th Pl., Chicago 23, Ill.
War Bonds for Victory
Buy MORE in '44!
ARMY E NAVY
WITTEK HOSE CLAMPS
Dependable Hose Connections



CP General-Purpose Diesel Power Unit

Compact . . . easily transported by truck . . . this completely assembled CP Diesel Unit is a versatile, economical power plant with a wide variety of applications in the petroleum, contracting, mining and other industries.

Complete with all accessories – intake filters, exhaust silencers, starting air equipment, oil and water cooling equipment – this CP Self-Contained, Semi-Portable Diesel Power Unit is ready for prompt operation upon arrival at location; no disassembly, assembly, piping or alignment required, when proper support is provided.

Available in three to eight-cylinder sizes; 150 hp to 640 hp; convertible to natural gas operation. CP Diesel Units are also furnished with variable or constant speed governors for general service or electric power applications.

Complete information on request.

★★★★★★★★★
PNEUMATIC TOOLS
ELECTRIC TOOLS
(Hicycle...Universal)
ROCK DRILLS

CHICAGO PNEUMATIC
TOOL COMPANY
General Offices: 8 East 44th Street, New York 17, N. Y.

★★★★★★★★★
AIR COMPRESSORS
VACUUM PUMPS
DIESEL ENGINES
AVIATION ACCESSORIES

The Cleveland Diesel Engine Division is a member of the National Association of Engine and Boat Manufacturers and its general manager, George W. Codrington, is president of the Association.

In discussing the award, Mr. Codrington, who is a vice president of General Motors, revealed that his company is carrying on a wide-scale program of replacement parts for the Navy, in addition to its important job of producing engines for submarines, escort vessels, minesweepers and other types. "Almost ten percent of our total dollar volume of production is for replacement parts necessary to protect the Navy against damage due to combat," Mr. Codrington stated. He also added that in the first four months of this year, more replacement parts had been delivered to the Navy than in all of 1942. He said that not only every man and woman at Cleveland Diesel was proud of the Army-Navy honor, but 94,000 employees of sub-contractors and suppliers can take pride in this latest recognition of merit by the Navy.

Millions of Chicago Screw Company Mushroom Valve Tappets are in use all over the world, in diesel and gasoline engines, in stationary industrial engines, truck, passenger car, tractor, bus and aircraft engines.

"Chicago" Mushroom Valve Tappets are made from steel and carburized, or cast iron with cam faces chilled. Quality and accuracy are rigidly controlled throughout every step from rough stock to finished material. Lightweight design, accuracy of machining operations, coupled with years of experience, has made "Chicago" Mushroom Valve Tappets the *1st* choice of motor engineers.

ARMY E NAVY

THE CHICAGO SCREW CO.

1026 So. Homan Avenue Chicago 24, Ill.

American Air Filter Announces Organizational Changes

THE American Air Filter Company, Inc., of Louisville, Ky., has announced organizational changes as follows. Mr. W. T. Frank has been appointed Assistant to the President. Mr. Howard C. Murphy, Vice President, has been appointed General Sales Director. Major Wm. K. Gregory has been placed in charge of the Special Products Division which includes Diesel engine accessories such as air filters and air cleaners. Mr. Howard W. Pound is in charge of the Air Filter Division and Mr. John Hellstrom, Vice President, is in charge of the Dust Control Division.

William K. Gregory

Major Gregory has recently returned to the organization after spending nearly two years in the Army. His last assignment was that of Chief of one unit in the Equipment Laboratory, Engineering Division, at Wright Field where he had charge of engineering and development of a number of projects in connection with airplane servicing and cargo handling.

Prior to being transferred to the Army Air Forces, Major Gregory spent about ten months in Chemical Warfare Service where he played an important part in the development and perfecting of the Portable Flame Thrower.

Major Gregory, known to his many friends in the Diesel Industry as, "Bill," says he is glad he was able to do his bit in the Army but he's damn glad to be back in civilian clothes.

Electro-Motive Division Reorganizes Its Service Department

RAPID increase in the use of General Motors Diesel locomotives throughout the United States within the past two years and anticipated acceleration of the rate of installation of this equipment in the post-war period has necessitated re-organization of the Service Department of Electro-Motive Division of General Motors, C. R. Osborn, General Manager, announced.

The re-organization tends in the direction of decentralization in order to place executive control of service and parts activities closer to the equipment in service. The service and parts functions have been separated. The country has been divided into three major service regions. The entire activity will be supervised by H. B. Ellis, former Service Manager, now Director of Parts and Service Divisions.

H. B. Ellis

Mr. Ellis has appointed D. H. Queeney, former Sales Engineer, to be Service Manager, and W. D. Davis, former Assistant Service Manager, to be Manager, Parts Division.

D. H. Queeney

Type H-3
Isochronous

A New
Massey Governor

Hydraulic Type with new basic principles:
Simplified design with fewer parts
Hydraulic speed indicator to give closer regulation
Hydraulic control of speed giving much wider speed range than ever possible before
Hydraulic compensation keeps sensitivity at any speed in its range
Adjustments allow perfect matching to any engine for generator or variable speed service
Ideal for combination speed and pressure or float control of engine driven compressors and pumps
Remote control for wide range locomotive and direct reversing marine service
Adaptable to entire line of engines regardless of service so that same mounting, drive and linkage can be used.

Write for Catalog H344

Builders of Jahns and Massey Type Governors for 36 Years

MASSEY MACHINE CO.
783 PEARL ST. WATERTOWN, N. Y.

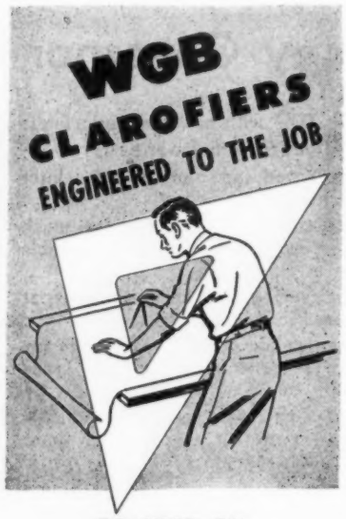
PLAN *Now*
TO RECOVER
WASTE HEAT

• After the war you will want to make changes that will reduce present Diesel operating costs. Heat recovery is an important method of converting waste dollars into profit dollars. Investigate the Sims method of heat recovery that can provide heat for heating or process and protect your Diesel at the same time. *Make your plans now.*

WRITE FOR SIMS BOOKLET

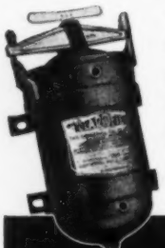
THE SIMS CO., ERIE, PA.

HEAT EXCHANGERS · · · OIL COOLERS · · · OIL FILTERS · · · OIL HEATERS · · · FEED WATER HEATERS
STEAM SEPARATORS · · · STORAGE WATER HEATERS · · · UNIT PULVERIZERS



TO KEEP OIL CLEANER, LONGER

WGB Clarofiers are adopted by manufacturers, specified for fleets. Leading builders of gas and Diesel engines install WGB Clarofiers as standard equipment . . . and countless cost-wise fleet operators have specified them for their vehicles. Check their three reasons. (1) They keep lubricating oil amber-clear for longer periods. (2) WGB replacement cartridges are inexpensive, and can easily be installed, without tools. (3) WGB Clarofiers are sturdy, simple, trouble-free—built for heavy-duty jobs. Specify WGB Oil Clarofiers for substantial savings in maintenance and operating costs.



Send for your free copy of book describing WGB oil clarofying at work in gas and Diesel engines.

WGB
OIL CLARIFIER, INC.
KINGSTON, N. Y.

LET'S KEEP SEDIMENT OUT OF LUBRICATION

C. L. Olsen, former district service engineer, at Miami, Florida, has been appointed Manager Eastern Region with headquarters at New York, and Thorwald O. Robertson, former district service engineer, Manager Western Region, retaining his headquarters at Los Angeles. The Central Region will be directed from the plant at La Grange, Illinois, for the time being.

C. L. Olsen

Mr. Ellis joined Electro-Motive in 1926 as Assistant Manufacturing Superintendent. He was made Assistant Service Manager in 1928 and Service Manager in 1930. He came to Electro-Motive from the White Motor Truck Company.

T. O. Robertson

Mr. Queeney was Service Manager of the Commercial Truck Company and Sales Engineer

"You've Certainly Got Something and the Trucking Industry Is Looking For It!"

Says Mr. R. Aramiam, Fleet Supt., Roosevelt Cartage Co., Chicago, Ill.

LIKE 95% of the operators of more than 100,000 motor vehicles recently surveyed, Mr. Aramiam says he "would more than welcome a dependable self-locking nut—a nut that *can't* shake loose."

Once tight, the Boots Nut *stays* tight. Its built-in lock holds an unshakable grip—will never loosen, until you take off the nut for use again. Being 100% metal, Boots are not affected by oil, gasoline, heat or cold.

Prominent fleet operators like R. H. Macy & Co., Metropolitan Distributors, Inc., United Parcel Service and others have tested the Boots Nut over many months and *proved* how effectively it eliminates need for re-tightening.

The Boots Nut was developed and first put into production in 1942. Since no design changes are necessary for its use, you can expect Boots protection on even the *first* post-war models of trucks, buses and passenger cars.

The ALL-METAL LOCK Is Built In Here

BOOTS
SELF-LOCKING NUTS
"There's No Excuse for a Nut Shaking Loose"
Boots Aircraft Nut Corporation
Dept. A-15 New Canaan, Conn.

Motion Picture—"All Work And No Play"—16 mm. sound—30 minutes. Write for Information
Representatives in New York • Chicago • Detroit • Indianapolis • Los Angeles • Kansas City • Dallas • Toronto • Montreal • Vancouver

for the International Motors Company before becoming a member of the Engineering Department of Electro-Motive in 1929.

W. D. Davis

Mr. Davis joined the former Winton Engine Division of General Motors after graduation from General Motors Institute in 1933. He was transferred to the Electro-Motive Division when that organization was separated from the Winton Engine Division.

Just Off the Press—The Diesel Engine Catalog, Volume 9

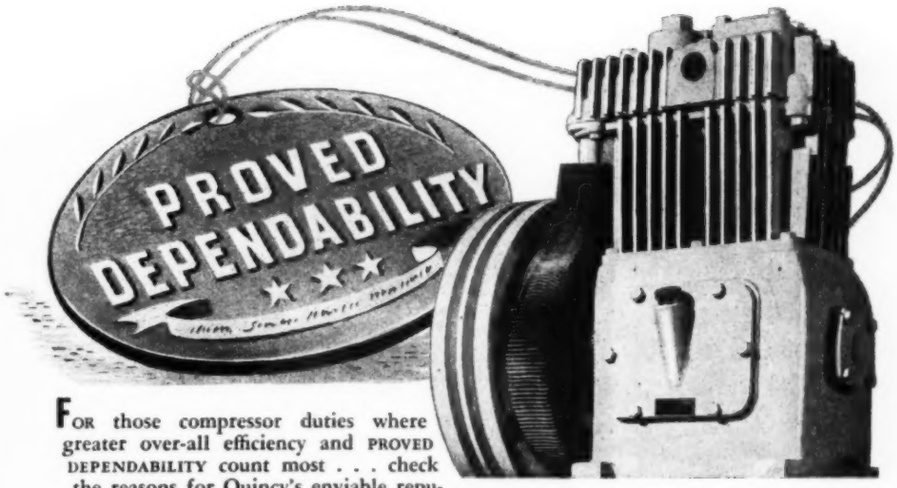
VOLUME Nine, the 1944 Edition of the DIESEL ENGINE CATALOG, edited by Rex W. Wadman is now available. Not a reprint of previous editions but a completely revised Catalog of the Diesel and associated Industries. The only book of its kind offered, the DIESEL ENGINE CATALOG is indispensable for all who want to know the facts about the Diesel engines and accessories manufactured in the United States. Engine and equipment sections and Market Place directory have been revised and brought up to the minute; price is the same—$5; a convenient order blank will be found elsewhere in this issue.

Third Renewal of Army-Navy "E" To Ferguson

FOLLOWING is the letter received by F. Ferguson & Son, announcing the third Army-Navy "E" award for sustained production of war materials.

"Dear Mr. Ferguson:

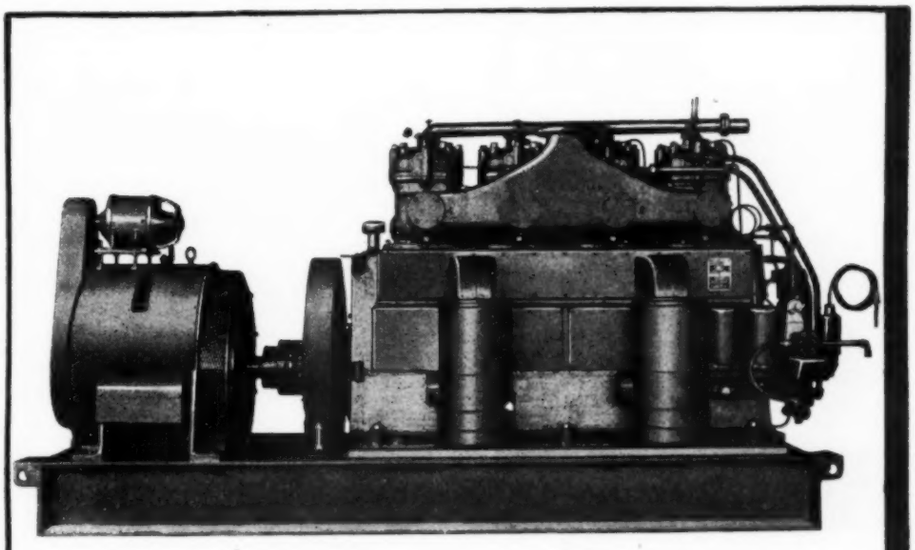
"It is my pleasure to announce that in recognition of the continued outstanding production of the men and women of your company, the Navy Board for Production Awards at its last meeting granted F. Ferguson & Son, Incorporated a third renewal of the Army-Navy



FOR those compressor duties where greater over-all efficiency and PROVED DEPENDABILITY count most . . . check the reasons for Quincy's enviable reputation. You'll find it rests solidly upon advanced, improved design features — *both* inside and out. For Diesel starting and other services requiring intermittent pressures up to 500 lbs. per square inch, Quincy offers the most complete line of compact compressors ranging from 1 to 80 cubic feet displacement in air and water cooled models. As exclusive manufacturers of air compressors for nearly a quarter century, Quincy *specialists* stand ready to help you. Call one in on your next compressed air problem. Or write Dept. K-17.

Quincy
COMPRESSORS

QUINCY COMPRESSOR CO., Quincy, Illinois • Branch Offices: New York • Chicago • San Francisco • St. Louis



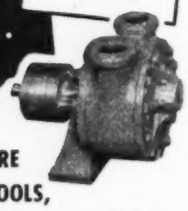
DUPLEX DIESEL ELECTRIC GENERATING PLANT,

600 RPM, 60 K.W.

Duplex Truck Co.
Lansing, Michigan

JUST WHAT THE DOCTOR ORDERED...

Rx



TUTHILL HIGH PRESSURE PUMP FOR MACHINE TOOLS, ENGINES AND HYDRAULIC MECHANISMS

Here's high pressure in a compact package. Tuthill Model CK internal gear rotary pumps save space, material and money. Sizes from 1 to 50 g.p.m. Pressures up to 400 p.s.i. Direct motor drive, V-belt units and integral drives.

★ Write for Model CK Bulletin

SERVING ARMY NAVY • AIR FORCE MERCHANT MARINE

Tuthill

TUTHILL PUMP COMPANY

939 E. 95th STREET • CHICAGO 19, ILL.

CHECK YOUR FUEL SUPPLY AT A GLANCE

Write for Bulletin

THE LIQUIDOMETER CORP.

20-24 Skillman Ave. Long Island City, N. Y.

MILWAUKEE VACUUM OIL REFINER

For Marine and Stationary Diesel Installations

Holcomb Engineering Company

77-35 113th Street

Forest Hills • New York

"NORMA-HOFFMANN"

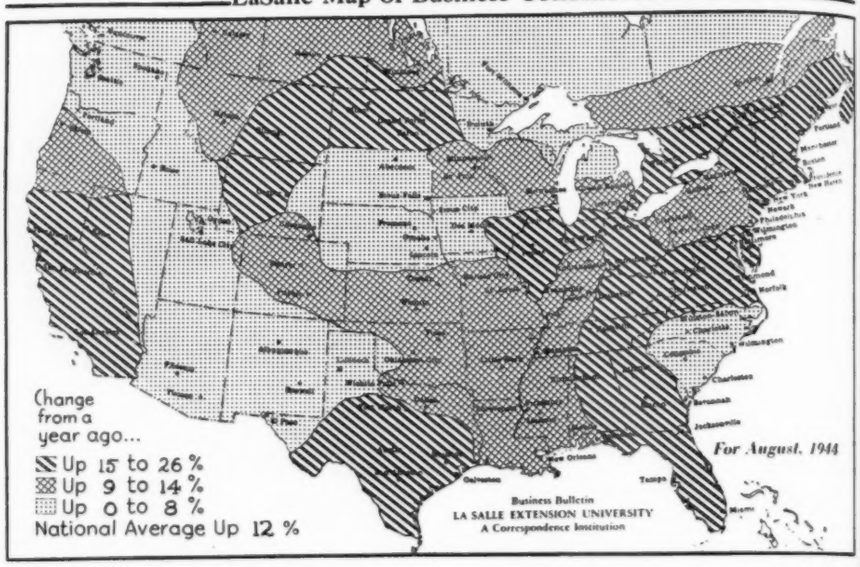
PRECISION BEARINGS

BALL, ROLLER AND THRUST

Norma-Hoffmann is devoting all its resources and its 30 odd years' experience to the production of Precision Bearings for Army, Navy and Air Corps units.

NORMA-HOFFMANN BEARINGS CORP'N., STAMFORD, CONN., U. S. A. — FOUNDED 1911

LaSalle Map of Business Conditions


Change from a year ago...
Up 15 to 26 %
Up 9 to 14 %
Up 0 to 8 %
National Average Up 12 %
For August, 1944
Business Bulletin
LA SALLE EXTENSION UNIVERSITY
A Correspondence Institution

Business Volume Rises to 12 Per Cent Above Last Year

Map Supplied by BUSINESS BULLETIN DIVISION of La Salle

The rate of industrial and trade activity rose last month after a period of relative stability. In very few places have there been any significant signs of summer slackening. The total volume of business transactions is about 12 per cent higher than it was a year ago. The production of many types of civilian goods and retail trade have held up much better than was generally considered possible. Even after a large percentage of industry was devoted to war production the supplies of consumer productions turned out has been large.

The LaSalle Map this month shows changes which may indicate some of the shifts which may be expected to become more prominent during the coming months. The trend is now toward somewhat greater changes in the East than in the West. Part of this difference is due to the fact the opposite trend was taking place a year ago. The enormous production of military supplies for the war in Europe also accounts for some of the greater increase in the East.

Business in parts of New England is making a considerably better showing than it has for several months. In many cities the rate of production and the volume of business has increased over last year by much more than the national average. Business is very active in the area around New York city. The shipment of goods abroad is now larger than it ever was before and transactions in connection with the handling of these shipments has boosted the volume of business there

The expansion of production in the industrial region around the Great Lakes is continuing but at a somewhat slower pace than it was during most of the last three years. The spread between the rate of business activity this year and that of last year is steadily becoming narrower and future expansion will probably be about the same as the national average. When military production is curtailed, further slowing down can be expected.

In the Southeast and in much of Texas, activity is being maintained at considerably above the national average. Growing conditions for the cotton crop, and other agricultural products have been quite favorable and relatively stable prices have kept up farm income. Another stimulating factor has been the large spending in connection with the military camps. Dry weather has made the farm outlook a little less certain in some regions but it has not yet seriously affected business volume.

In the Southwest conditions are about the same as the national average. The outlook is for rising business volume, however, due to the unusually large winter wheat crop. At present prices, it will assure large farm incomes in that region. The greater production of petroleum has also been a stimulating factor.

Business conditions in the southern half of the Pacific Coast region have continued to be better than average but by smaller percentages than they were throughout most of the time during the last few years. They are far above the levels which prevailed during the prewar years and the long-term expansion has been greater than in any other part of the country. Along the coast to the north, activity has been slowing down, but it is still higher than it was a year ago.

The business situation in Canada has changed but little in recent weeks but the trend in most places is still gradually upward. The best showing is being made in the industrial region north of the Great Lakes but a high level of activity is being maintained in the agricultural sections as well. The volume of trade is running just a little higher than the output of goods but the differences are not great. The outlook is for a continuation of the gradually rising trend, with the prospect that many new records will be made in production this year.

DOUBLE SEAL PISTON RINGS

SEALS THE GROOVE

SEALS THE WALL

DOUBLE SEAL RING CO., Fort Worth, Texas

L. O. KOVEN & BRO. INC.

PARTS MADE TO SPECIFICATION FOR MANUFACTURERS OF DIESEL ENGINES

154 OGDEN AVE. JERSEY CITY, 7 N.J.

Plants — JERSEY CITY • DOVER, N.J.

REINER

GENERATING SETS *and* AUXILIARY UNITS

Reiner Marine Auxiliary Unit

Made to Order

You need auxiliary power . . . auxiliary air . . . auxiliary pumping capacity. With a Reiner Auxiliary Unit you don't have to fit your requirements into the "nearest" unit. Rather the above equipment is selected to fit your requirements and then assembled into a compact unit.

That's what makes Reiner Auxiliary Units the better buy . . . what has influenced such exacting buyers as the Army, Navy, Coast Guard and Maritime Commission to accept Reiner.

JOHN REINER & COMPANY

12-12 37th Avenue

Long Island City 1, N. Y.

9-RC-1

"E" Award. You should receive the new flag with three stars in the near future.

"The congratulations of the Navy Department are extended to each and every man and woman of F.. Ferguson & Son, Incorporated for maintaining the high production standards required first to win the award and then to receive the three stars which, in token of appreciation from the men on the fighting fronts, will be affixed to the new flag you are to fly over your plant.

"This additional honor you have won indicates your determination to supply our fighting forces with the materials needed to bring the war to a successful conclusion."

Signed; C. C. Bloch
Admiral, USN (Ret.)
Chairman, Navy Board for Production Awards

Eisemann Corporation Names H. R. Metz, Works Mgr.

EISEMANN Corporation, manufacturers of magnetos, generators, ignition and fuel injection systems, announces appointment of H. R. Metz as Works Manager in charge of all divisions.

H. R. Metz

During the last two and one-half years, Mr. Metz has been engaged in starting major defense projects, among which was the new Diesel Fuel Injector plant of American Bosch Corporation, at Providence, R. I., where he was Works Manager.

Prior to the war, Mr. Metz was Works Manager for the Thermal Engineering Corporation, Richmond, Va., Works Manager of the Oster

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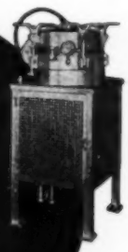

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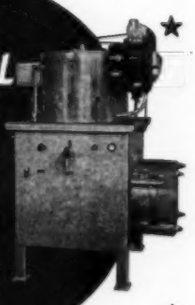

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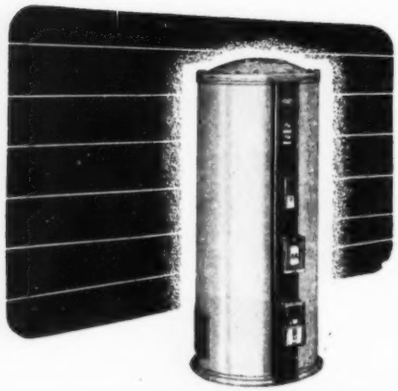

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EDITED by Rex W. Wadman, the 1944 edition of the DIESEL ENGINE CATALOG, Volume 9, contains descriptions and detailed specifications of 295 Diesel Engines. Each engine and equipment manufacturer's section has been revised and brought up to the minute. An up-to-date Market Place Directory of engines and accessories is included. It is the bible of the Diesel and allied industries, widely used by design engineers, naval architects, consulting engineers, operating engineers and personnel, users and potential users of Diesel prime movers and accessories. By far the biggest edition yet published—an indispensable book for all concerned with Diesels. Not a reprint of previous editions—price only remains the same, $5. The supply is limited by the paper situation. Order your copy today—use convenient order blank elsewhere in this issue.

MacDonald Says $4,600,000,000 New Construction Needed for War-Deferred Highway Projects
A Measure of the Diesel Equipment Needed

MORE than $4,600,000,000 in highway construction has been reported by the state highway departments as being needed just to "catch up" in programs deferred on account of war, Commissioner Thomas H. MacDonald of the Federal Public Roads Administration, declares in the annual directory issue of *The Constructor*, official publication of the Associated General Contractors of America, the national organization of leading general construction firms.

The amount of additional construction required to make the nation's highways adequate to meet after-war transportation demands will be considerably more than that required to catch up on work deferred, he explains, in discussing

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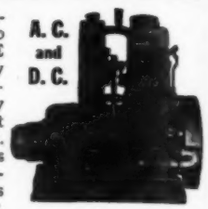

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highway construction as a field of employment in the immediate post-war period.

"Reports from the highway departments as of June 1, 1944, show that surveys and preparation of plans are under way or have been completed for about half of the deferred projects," he says. "The remaining projects are still in the discussion stage. There is no doubt that they are all vitally needed to modernize obsolete sections of highways and to remove bottlenecks. Lack of engineers is very largely the reason for delay in preparation of plans."

No immediate figures are on hand as to the volume of construction planned by cities, counties and political subdivisions, when materials and labor become available for essential work on the nation's streets and highways and bridges, Mr. MacDonald declares, but it is quite apparent that this work will also run into a substantial sum.

"The programs thus far reported by the various states include $3,323,000,000 worth of work on rural roads and $1,277,000,000 on urban routes," he states. "A breakdown of the $2,216,000,000 worth of construction advanced to the survey or design stage shows that as of June 1, 1944, plans have been completed by the state highway departments for projects to cost $214,533,000; that projects estimated at $932,512,000 are being designed, and that projects to cost $1,069,415,000 are now under survey for preparation of designs and working plans. . . ."

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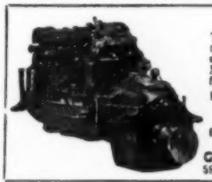
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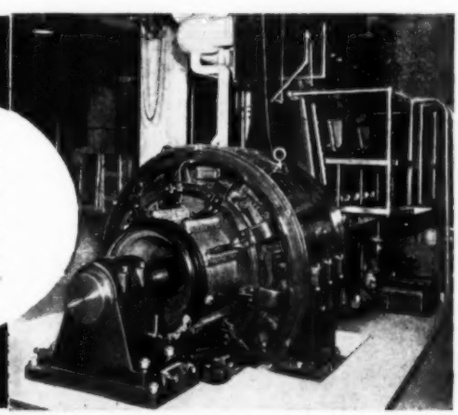

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West Coast Diesel News

By JIM MEDFORD

FOR installation in the first steel tuna clipper a 300 hp. Superior Diesel and two Superior Diesel auxiliaries are ordered by Hodgson-Greene-Haldeman, Long Beach, California; Alnor pyrometer, F-M pumps and Luber-finers included.

A 62-FOOT tuna clipper by North American at Newport Harbor, California, for unnamed owners will have a 150 hp. Atlas Diesel with Caterpillar auxiliary and F-M pumps has keel laid.

ANOTHER Atlas marine Diesel powered fisherman all ready started is a 51-footer for Lasarich Bros. of Santa Barbara, California; also by the North American and with a 85 hp. main engine.

TWIN Murphy Diesels of 150 hp. have been installed in the 185-foot Coast Guard cutter *Cosmos*. In addition to three-to-one reduction gears, the engines are pilothouse controlled by Westinghouse pneumatic throttle and clutch assemblies.

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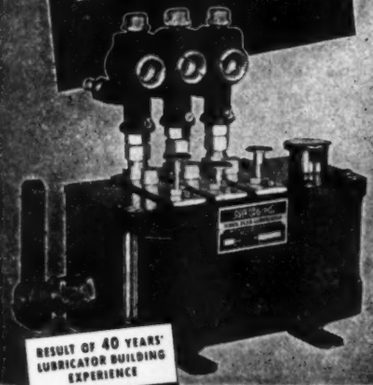

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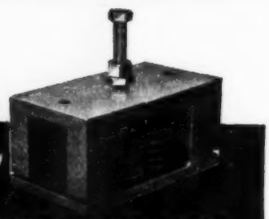

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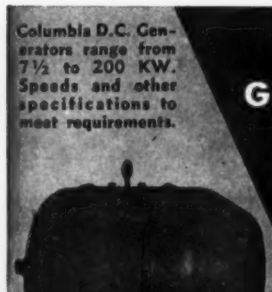

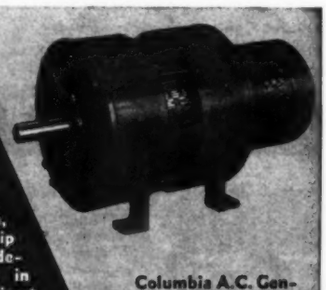

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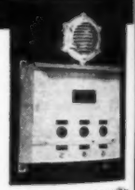

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LYNCH Shipbuilders of San Diego, California, have completed the 84-foot *Victory* for Marques & Medina, powered with 240 hp. Washington Diesel; Caterpillar Diesels with F-M generators, GE motors, Weston tachometer and Manzel lubricators.

QUEENSBORO Shipyard, New Westminster, B. C., have launched a new 60-foot seiner for Will Pitre. The main engine is a 135 hp. Murphy Diesel.

AT Vancouver, B. C., Burrard Shipyards for B. C. Packers have installed a 320 hp. Fairbanks-Morse Diesel, two-cycle and fresh-water cooled, in their 90-foot tender.

ON Humbolt Bay, California, Joe Balestrieri has under construction a 78-foot purse seiner of 130 tons to be powered with a 230 hp. Enterprise Diesel. Batteries are Exides.

FOR herring fishing the 76-foot *Cape Karluk* has been launched by the Seattle Shipbuilders for Haug and Wakefield. Engines are twin General Motors with Twin Disc gears to single shaft, 165 hp. each; Burgess mufflers, Exide batteries.

JOE ROSA'S *Fatima*, 100-foot tuna clipper by Hodgson-Greene-Haldeman of Long Beach, California, will have a 400 hp. Enterprise Diesel, two 90 hp. Caterpillar auxiliary Diesel-electric units and Fairbanks-Morse motors and pumps.

SOMETHING new in fish boat hulls is the *Newcomer*, a 56-footer with glued seams instead of caulked. Engine is a 115 hp. Caterpillar Diesel with Twin Disc gears by Drake and Mardesch, San Pedro, California.

AT Pacific Grove, California, the E. P. Fisher-owned 51-foot *Thelma Kay*, completed by North American, will fish for Monterey sardines. She has a 120 hp. Buda Diesel and Twin Disc gears.

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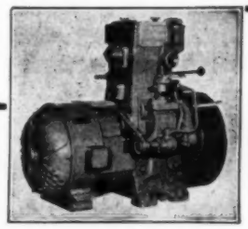
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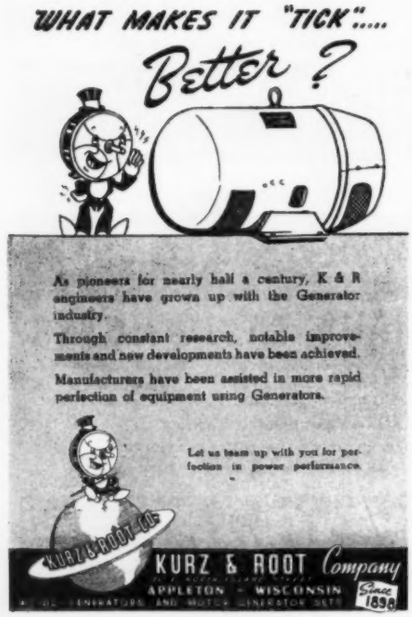
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